

Division of Life Science
The Hong Kong University of Science & Technology
LIFS3020
Molecular & Cellular Biology II
(Spring 2017)

1. Instructors

| Instructors | Office | Extension | E-mail address |
|--------------------------------------|---------------|------------------|-----------------------|
| Randy Y.C. POON (Course Coordinator) | Room 5526 | x8703 | rycpoon@ust.hk |
| Pingbo HUANG | Room 5463 | x7305 | bohuangp@ust.hk |

2. Teaching Assistant

NA

3. Meeting Time and Venue

Date/Time: Monday: 10:30-11:50

Wednesday: 10:30-11:50

Venue: Room 2407

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

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| Feb 5 | Overview of the molecular biology of cellular regulation |
| Feb 7 | Signaling Transduction |
| Feb 12 | Signaling Transduction |
| Feb 14 | Signaling Transduction |
| Feb 19 | Public holiday |
| Feb 21 | Signaling Transduction |
| Feb 26 | Signaling Transduction |

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|------------------|--|
| Feb 28 | Cell adhesions |
| Mar 5 | Cell adhesions |
| Mar 7 | Cell adhesions |
| Mar 12 | Cell differentiation |
| Mar 14 | Cell differentiation |
| Mar 19 | Cell differentiation |
| Mar 21 | Mid-term exam |
| Randy Y.C. Poon: | |
| Mar 26 | Cell cycle control |
| Mar 28 | Cell cycle control |
| Apr 2 | Public holiday |
| Apr 4 | Mid-term break |
| Apr 9 | Cell cycle control |
| Apr 11 | Cell cycle control |
| Apr 16 | Maintenance of genome stability by checkpoints |
| Apr 18 | Mechanisms of cell division |
| Apr 23 | Programmed cell death - the functions of apoptosis |
| Apr 25 | Molecular mechanisms of apoptosis |
| Apr 30 | Molecular mechanisms of apoptosis |
| May 2 | Telomere in normal replication, senescence, and cancer |
| May 7 | Telomere in normal replication, senescence, and cancer |
| May 9 | Special current topics |

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