

**LIFS4620** (by Profs. Mingjie Zhang, Zhenguo Wu)

### **Key OBE Features**

This is an elective course designed mainly for the final-year undergraduate students and junior graduate students. In this course, we aim to familiarize students with key concepts in cellular signaling and structure-function analysis of proteins, to teach them how to analyze, critique, and present scientific papers, and to acquaint them with commonly used techniques and latest technological breakthroughs. We feel that this course will give students not only the basic knowledge but also practical skills which will be very useful for junior graduate students and those undergraduate students who intend to pursue graduate studies after their graduation.

### **Intended Learning Outcomes:**

1. be able to independently collect information for the assigned project
2. be able to analyze and critique scientific papers
3. to develop essential skills in scientific communication.
4. to learn how to work in teams
5. to understand the principals and applications of latest technological breakthroughs

### **Design of teaching and learning activities, assessment and assessment of criteria:**

**Teaching and learning activities:** Basic concepts in cell signaling and structure-function analysis of proteins, as well as principals and application of key techniques will be taught first.

In the first half of the semester, the pro-inflammatory cytokine-mediated NF-kappaB pathway will be used as a paradigm to teach students how an important intracellular signaling pathway is established. Each student will be assigned a paper for in-depth analysis. Students are expected to carry out independent research on the assignment. They will then present the paper to the class followed by an instructor-guided Q&A session/discussion.

In the second half of the semester, students will be taught to use various on-line tools to analyze protein structures. Each student will be assigned either an accession number or a partial DNA/protein sequence and is expected to do a mini-project on the assigned proteins.

**Assessment:** The performance in oral presentation will count **60%** of the total marks. At the end of the semester, a 15-min face-to-face interview will be conducted with each student to test whether they really understand the key concepts taught in this course. This will count **20%** of the total marks. The remaining **20%** will be given to students with active participation and regular attendance.

### **Assessment criteria:**

1. For oral presentation: clear, logical, with sufficient background introduction, be able to provide your own analysis (e.g., what is good or bad about an experiment/a paper? Or what is unique about a particular protein?), be able to answer questions from instructors and fellow students.
2. For interview: understand key concepts taught, as well as the principals and applications of commonly-used and modern techniques.
3. attend all lessons and actively participate in discussion

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

**LIFS4620 Advanced Biological Chemistry**  
*(2016/17 Spring Semester)*

**Date/Time:** Tuesday, 10:30-11:50 am  
Thursday, 10:30-11:50 am

**Venue:** **Room 2503**

**Instructors:** Prof. Zhenguo Wu (x 8704, Room 5527)  
Prof. Mingjie Zhang (x 8709, Room 5532) (**Course Co-coordinator**)

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2 - 21 Feb	Introduction of protein kinase and common techniques used in signal transduction research.	Prof. Wu
23 Feb - 7 Mar	Signal transduction: NF- $\kappa$ B as a paradigm.	Prof. Wu
9 - 16 Mar	Student presentations	Prof. Wu
21 Mar - 6 Apr	Database search for data mining II (amino acid sequence analysis, consensus motif searching, secondary structure prediction)	Prof. Zhang
11 - 25 Apr	Structure of proteins	Prof. Zhang
27 Apr - 2 May	Specific examples highlight recent developments in biological chemistry.	Prof. Zhang
4 - 9 May	Student Presentations	Prof. Zhang