

Advanced Chemical Biology (Fall 2022)

Professors:

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 Institute of Biomedical Sciences, Academia Sinica

TA: TBD

Classroom: Department of Chemistry, NTU, Rm 210 (tentative)
 In-person classes. Slides and audio recording available for week 1 (09/05 – 09/08)

Hours: Mon. 13:20 – 15:10, Thu. 13:20 – 15:10

Office hours: Mon. 15:20 – 16:20 (Rm A521)

Language: English (lectures, exams, and student presentations shall all be given in English)
 Students must also answer exam questions in English

Grading: Midterm exam 35%; Final exam 35%
 Presentation 15%; Quizzes 10%; Discussion 5%; Class involvement 5%

Prerequisite: Everyone enrolled in this class should have taken undergraduate level biochemistry and organic chemistry. Some background information will be provided in the lectures. Undergraduate students can enroll only if they have already taken (and passed) biochemistry and organic chemistry.

Course Syllabus (check CEIBA website for updates)

#	Date	Day	Topic ^[1]	Note
1	09/05	Mon.	Course overview. What is chemical biology.	
2	09/08	Thu.	Experiments relevant to understanding the origin of life	
3	09/12	Mon.	Guest Lecture: CRISPR technologies	Kurt Mou
4	09/15	Thu.	Nucleobase, nucleoside, and nucleic acid	
5	09/19	Mon.	Guest Lecture: CAR-T technologies	Kurt Mou
6	09/22	Thu.	Nucleic acid synthesis and synthetic mimics	Quiz ^[2]
7	09/26	Mon.	Next generation sequencing (NGS) technologies	Discussion 1 ^[3]
8	09/29	Thu.	Applications of NGS technologies	
9	10/03	Mon.	RNA, aptamers, and ribozymes	
10	10/06	Thu.	Classic directed evolution experiments and recent advances 1	Discussion 2 ^[3]
11	10/10	Mon.	National Day	No class
12	10/13	Thu.	Amino acids, peptides, and proteins	Quiz ^[4]
13	10/17	Mon.	Ribosome and protein translation	Discussion 3 ^[3]
14	10/20	Thu.	Student presentation 1 ^[6]	
15	10/24	Mon.	Mid-term week	No class
16	10/27	Thu.	MID-TERM EXAM ^[4]	No class

17	10/31	Mon.	Post-translational modifications	
18	11/03	Thu.	Student presentation 2 ^[6]	
19	11/07	Mon.	Noncanonical amino acids incorporation into proteins	
20	11/10	Thu.	Classic directed evolution experiments and recent advances 2	Quiz ^[4]
21	11/14	Mon.	Protein conjugation methods	Discussion 4 ^[3]
22	11/17	Thu.	Protein degradation and misfolding	
23	11/21	Mon.	Carbohydrates and lipids 1	Quiz ^[4]
25	11/24	Thu.	Carbohydrates and lipids 2	
26	11/28	Mon.	Secondary metabolites 1	Discussion 5 ^[3]
27	12/01	Thu.	Secondary metabolites 2	Quiz ^[4]
28	12/05	Mon.	Please attend KT Wang Lectures (TBD) ^[5]	
29	12/08	Thu.	Super-resolution fluorescence imaging	
30	12/12	Mon.	TBD	
32	12/15	Thu.	TBD	
33	12/19	Mon.	FINAL EXAM ^[4]	