

## Molecular & Cellular Approaches to Biotechnologies 分子與細胞生物科技

Offering time: 2024 Spring Semester

Coordinator : Dr. Pei-Wen Hsiao 蕭培文

Classroom : RmA236, 2F, Agricultural Technology Building, Academia Sinica (中研院農科大樓 236 教室)

Time : Monday afternoon, 14:00~16:00

Credit :

1. 4 credits (core course): MBAS 1<sup>st</sup> year students who took part I (course name: Core Approaches for current molecular biology research) in Fall semester and take this part II will receive 4 credits together in this semester.
2. 2 credits (elective course): non MBAS students who take this elective course will receive 2 credits in this semester.

Course description: This course offers an introduction to basic and advanced biotechnology systems with an emphasis on the use of transgenic approaches for research in modern biosciences. The lectures include approaches using genomics, epigenetics, proteomics, and metabolomics to study key questions for biotechnology development. Examples comprise plant and animal disease models and their interactions with microbes to deliver valuable biological molecules and agricultural products. Students taking this course are required to submit two term papers aiming the training for writing a research proposal on biotechnology to address key questions in cutting-edge biotechnology and an invention disclosure to pursue patent protection based on recent progress in biological science.

Date	Topic	Lecturer
2/19	Introduction	蕭培文 (Pei-Wen Hsiao)
	Research and Development using Transgenic Biotechnology	
2/26	Systems biology and predictive biology in plant research.	吳亭穎 (Ting-Ying Wu)
3/4	Single-cell omics: applications to plant, algal and microbiological research	顧銓 (Chuan Ku)
3/11	Small-RNA-mediated gene regulation and its applications in plants	陳荷明 (Ho-Ming Chen)
3/18	The crossroads of algal biotechnology	方素瓊 (Su-Chiung Fang)
3/25	Discovery/Development of Natural Products as Therapeutics	李宗璘 (Tsung-Lin Li)
4/1	Study of molecular mechanisms for human genetic diseases	李宜靜 (Yi-Ching Lee)
4/8	Design and Application of Chimeric Antigen Receptors on Immune Cells for Cancer Immunotherapy	吳岱娜 (Tai-Na Wu)
4/15	Translational mouse models for Immunotherapeutic Discovery & Development	陳繪名 (Hui-Ming Chen)
4/22	Development of antiviral strategies on plants	葉信宏 (Hsin-Hung Yeh)
	<b>Midterm paper due before 2:00pm (Research Proposal)</b>	
4/29	Root development in plants ; basic biology and biotechnology	山田昌史 (Masashi Yamada)

5/6	Induced Neuronal Differentiation - A Therapeutic Approach for Neuroblastoma	廖永豐 (Yung-Feng Liao)
5/13	Gene and cell-based bioreactors, animal tumor model and therapeutics	蕭培文 (Pei-Wen Hsiao)
5/20	Analytical Instrumentation for Application to Biotechnology	陳逸然 (Yet-Ran Chen)
5/27	In vivo biochemistry -Watching and quantifying biochemical processes in intact plants	何承訓 (Cheng-Hsun Ho)
6/3	Regulation of chromatin structure in Transcription and Genomic Stability	高承福 (Cheng-Fu Kao)
6/10	<b>National holiday (no class)</b>	
6/17	Anther and Pollen: from Biology to Biotechnology	孫德芬 (Der-Fen Suen)
	<b>Final paper due before 2:00pm (Patent disclosure)</b>	