

Course : Structural Biology, Bioinformatics and Drug Target of Infectious and Noncommunicable Diseases

疾病結構生物資訊學

Lecturer : Wen-guey WU 吳文桂 (LS Build I: room 419)

Time: Thursday afternoon R6R7 (14:20-16:10)

This course is a credit graduate level course certified by the Ministry of Education in Taiwan. It is designed to provide students with an in-depth overview of the concepts and applications of structural biology and bioinformatics to diseases. Students will learn how to use frontier biotechnologies to investigate infectious and non-communicable diseases and facilitate potential student's choice for the future research projects. The course will cover three major sections: (1) Introduction to Infectious and noncommunicable diseases (2) Introduction to structural biology and bioinformatics tools (3) Application of structural biology and bioinformatics to diseases. The course will be discussed in English after assigned reading by students; and it has been offered to international students as a condensed winter course in Pasteur Institute Nhy Trang. We also offer here to the graduate students in NTHU for the Spring Semester, 2020. Since the course is designed to help students getting into research topics, students who try to elect this class should ask for permission and discuss with the lecture beforehand.

Section 1: Introduction to Infectious and noncommunicable diseases

1 st Week	Feb20	WHO and Neglected tropical diseases
2 nd Week	Feb27	Research tools for infectious and non-communicable diseases
3 rd Week	Mar05	Influenza, Diphtheria, Measles, Zika virus in Asia
4 th Week	Mar12	Antimicrobial resistance
5 th Week	Mar19	Innate and adaptive immune response
6 th Week	Mar26	Hijacking cell signaling pathway
7 th Week	Apr09	Midterm I (20%)

Section 2: Introduction to structural biology and bioinformatics tools

8 th Week	Apr16	Proteins, lipids, carbohydrates and DNA/RNA as targets
9 th Week	Apr23	Protein structure and disease association
10 th Week	Apr30	Interplay between ligand and membrane receptor
11 th Week	May07	Principle and tools for detection of <i>in vivo</i> protein-protein interaction
12 th Week	May14	X-ray, NMR and EM techniques for structural biology
13 th Week	May21	Midterm II

Section 3: Application of structural biology and bioinformatics to diseases

14 th Week	May28	Use genomics to understand infectious disease spread
15 th Week	Jun04	Vaccines and microbiota
16 th Week	Jun11	Computer-Aided Drug Design
17 th Week	Jun18	Final Examination (30%)

1. The assigned reading will be posted at NTHU iMLS website for registered students.
2. Grade: (I)Midterm I & II (40%), (II)Oral (30%), (III)Final (30%)