

Course : Glycobiology - Principle, Disease and Application
醣類生物學 - 原理·疾病及應用

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

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

Cell consists of biomolecules of DNA/RNA, protein, lipid and carbohydrates for its function, but our understandings of cellular structure and function have been mainly focused on DNA/RNA and proteins. Recent technological advances in knock-out mice, siRNA and MASS spectroscopy, however, have gradually changed the situation to allow the structural and functional characterization of lipidomics and glycomics. In this course, we will provide the historical background and evaluate the structural basis and functional role of several biologically important glycoconjugates such as N-Glycans, O-Glycans, Glycosphingolipids and Proteoglycans. Issues relating to the role of glycans in cell signal/development and human disease will then be discussed by using literatures available within the last couple years.

1 st	Week Sep14	Historical Background & Structural Diversity
2 nd	Week Sep21	Carbohydrate Structure Workshop (10%)
3 rd	Week Sep28	Glycoconjugates I: Structure and Function of N-Glycan
4 th	Week Oct05	Glycoconjugates II: Structure and Function of O-Glycan
5 th	Week Oct12	Glycoconjugates III: Structure and Function of Glycolipids
6 th	Week Oct19	Glycoconjugates IV: Glycosaminoglycans and GPI anchor
7 th	Week Oct26	Midterm I (20%)
8 th	Week Nov02	Glycosylation effect on Structure and Function
9 th	Week Nov09	Glycosylation on protein secretion and quality control
10 th	Week Nov16	Glycan recognition I: Cell adhesion
11 th	Week Nov23	Glycan recognition II: Cell signaling
12 th	Week Nov30	Midterm II (20%)
13 th	Week Dec07	Glycobiology of Plant, Bacteria and Virus
14 th	Week Dec14	Glycobiology and Development
15 th	Week Dec21	Glycobiology and Disease
16 th	Week Dec28	Oral Presentation Group I
17 th	Week Jan04	Oral Presentation Group II (30%)
18 th	Week Jan11	Final Examination (20%)

1. Introduction to Glycobiology (3rd Edition) (by Maureen E. Taylor Kurt Drickamer, Oxford) (2011)
2. Essentials of Glycobiology (3rd Edition) (by Ajit Varki, Cold Spring Harbor, NY, USA: Cold Spring Harbor Laboratory Press) (2017) (NCBI download <http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=glyco2>)
3. Assigned reading and review articles
4. Grade: (I)Midterm(20%)、(II)Oral(60%)、(III)Final(20%)