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.

1st Week Feb21 Historical Background & Structural Diversity
2nd Week Mar07 Carbohydrate Structure Workshop (10%)
3rd Week Mar14 Glycoconjugates I: Structure and Function of N-Glycan
4th Week Mar21 Glycoconjugates II: Structure and Function of O-Glycan
5th Week Mar28 Glycoconjugates III:Structure and Function of Glycolipids
6th Week Apr11 Glycoconjugates IV: Glycosaminoglycans and GPI anchor
7th Week Apr18 Glycosylation effect on Structure and Function
8th Week Apr25 Glycosylation on protein secretion and quality control
9th Week May02 Midterm I (20%)
10th Week May09 Glycan recognition I: Cell adhesion
11th Week May16 Glycan recognition II: Cell signaling
12th Week May23 Midterm II (20%)
13th Week May30 Glycobiology of Plant, Bacteria and Virus
14th Week Jun06 Glycobiology and Development/Disease
15th Week Jun13 Oral presentation
16th Week Jun20 Final Examination (30%)

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 (40%)、(II)Oral(30%)、(III)Final(30%)