

授課教師：邱繼輝 (Kay-Hooi Khoo) / 林俊宏 (Chun-Hung Lin)

This course aims to teach the fundamentals and applications of **Glycobiology** in the broader context of functional glycomics, based on the recently updated textbook “Essentials of Glycobiology 2nd Edition”, which is freely available on the NCBI bookshelf, and other web materials on the Nature Functional Glycomics Gateway. From the cause and consequences of onco-developmental changes in glycosylation to proteins that recognize, bind and mediate the functions of glycans, students are introduced to essential concepts and recent developments in the field. Current pursue in both basic research and medical applications, including the historical development of neuraminidase inhibitors (e.g. Tamiflu) and glycans involved in viral infections are discussed in the context of what chemical approaches are available to glycobiologists for diagnostics and therapeutics. Seminars are organized for students in groups to present and discuss key original research papers, which together with following up written report, will constitute the principal course work and assessment.

No.	Date	Content	
1	2/16	Course Introduction : Essentials of Glycobiology (Chapters 1, 6, 7) and Functional Glycomics	KKH
I. Fundamental Glycobiology & Functional Glycomics			
2	2/23	Glycosylation Changes in Cancer and Development (Chapters 38, 43, 44)	KKH
3	3/02	Lectins : Translators of Glycan Functions (Chapter 26)	KKH
4	3/09	R-, L- and P-type Lectins (Chapters 28, 29, 30)	KKH
5	3/16	Selectins & other C-type Lectins in innate immunity (Chapter 31)	KKH
6	3/23	Siglecs & other I-type Lectins (Chapter 32)	KKH
7	3/30	Galectins (Chapter 33)	KKH
8	4/06	Seminar and Discussion	
9	4/13	Seminar and Discussion	
II. Medical Glycobiology & Therapeutic Applications			
10	4/20	Glycans involved in bacterial and viral infections (Chapter 39)	LCH
11	4/27	Genetic Disorders in the Degradation and Biosynthesis of Glycans (Chapters 41, 42) and Glyco-enzyme Inhibitors for Therapeutics (Chapter 50)	LCH
12	5/04	Glycan Analysis - from Lectins to Glyco-Arrays (Chapter 45)	LCH
13	5/11	Chemical Synthesis of Glycans (Chapter 49)	LCH
14	5/18	Enzymatic Synthesis of Glycans (Chapter 49)	LCH
15	5/25	Glycans in Biotechnology and the Pharmaceutical Industry (Chapter 51)	LCH
16	6/01	Seminar and Discussion	
17	6/08	Seminar and Discussion	

Reading Materials :

1. NCBI Bookshelf - Essentials of Glycobiology

<<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=glyco2>>

Ideally, students should and will be encouraged to have read up Chapters 1 and 2 or taken courses based on similar content but these are not strict pre-requisites for this course.

2. Nature Functional Glycomics Gateway <
- <http://www.functionalglycomics.org/>
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