Simplicity in Complexity: Advanced Glycosylation for Carbohydrate and Glycoconjugate Synthesis

Xue-Wei Liu

Division of Chemistry and Biological Chemistry
Nanyang Technological University
Singapore 637371

E-mail: xuewei@ntu.edu.sg

Project: The diverse presence as well as their very specific bio-responses of glycoconjugates found in all living species requires scientists to synthesize and display the precise structure of these complex oligosaccharides and glycoconjugates for various studies in glycoscience. Multitudinous approaches to make glycosidic bonds in a highly stereoselective manner have speedingly emerged for the last two decades. Nonetheless, an efficient and universal method to confidently synthesize various glycoconjugates have yet been established, especially one that is applicable for large scale and structural diversity.

This lecture will present our recent advances in carbohydrate chemistry and glycobiology with emphasis on conceptually new strategies and tactics to illustrate our contribution to this field. Specifically, this talk will cover the acceptor-controlled glycosylation and protection-less glycosylation for oligosaccharide synthesis, and dual native chemical ligation (dNCL) for glycoprotein synthesis. I will present to you an easy access to peptidoglycans, which are used for metabolic labeling of bacteria.

Keywords: Acceptor-controlled glycosylation, dual native chemical ligations, glycoproteins, peptidoglycan, bacteria, metabolic labeling, active targeting

Selected Publications: 1) *Chem. Soc. Rev.* **2019**. *48*, 4006-4018; 2) *Acc. Chem. Res.* **2018**, 51, 628-639; 3) *Nature Commun.* **2017**, *8*, 1146 ; 4) *Angew. Chem. Int. Ed.* **2016**, *55*, 10363-10367; 5) *Angew. Chem. Int. Ed.*, **2015**, *54*, 604-607; 6) *Nature Commun.* **2014**, 5:5051*;* 7) *Angew. Chem. Int. Ed.*, **2013**, *52*, 5134-5137; 8) *J. Am. Chem. Soc.* **2012**, 134, *15229-15232*. 9) *Angew. Chem. Int. Ed.*, **2011**, *50*, 12054-12057. 10) *Chem. Soc. Rev.*, **2010**, 39, 2925-2934.

Biography: Xue-Wei Liu, China Agricultural University (BSc & MSc 1996), University of Southern California (PhD 2000), Procter & Gamble (Research Scientist, 2000-2002), Chugai Pharma USA (Senior Research Scientist, 2002-2003), Caltech (Postdoc, 2003-2005). Currently Professor at Nanyang Technological University, Singapore. Research field: carbohydrate chemistry, natural products, and glycoproteins in addressing problems of medicinal and biochemical significance.