

申洁晨，西北大学生命科学学院在读博士生。2017年以来，师从孙士生教授，主要研究方向为完整糖肽水平糖链结构的解析方法。在读期间，以主要参与人的身份参与了国家自然科学基金委的重大研究计划培育项目——“完整糖肽上 N-连接糖链结构的从头测序新技术研究”，并以此项目为基础，开发了完整糖肽糖链结构解析的策略以及软件 **StrucGP**。目前累计发表论文 6 篇（以第一作者发表论文一篇，以共同作者发表论文 5 篇），申请专利 1 项，授权专利 2 项。

主要发表的文章:

1. **Shen, Jiechen**, Jia, Li, Dang, Liuyi, Su, Yuanjie, Zhang, Jie, Xu, Yintai, Zhu, Bojing, Chen, Zexuan, Wu, Jingyu, Lan, Rongxia, Hao, Zhifang, Ma, Chen, Zhao, Ting, Gao, Ni, Bai, Jieyun, Zhi, Yuan, Li, Jun, Zhang, Junying and Sun, Shisheng; StrucGP: de novo structural sequencing of site-specific N-glycan on glycoproteins using a modularization strategy; *Nature Methods*; 18 (2021); 921-929.
2. Dang, Liuyi, **Shen, Jiechen**, Zhao, Ting, Zhao, Fei, Jia, Li, Zhu, Bojing, Ma, Chen, Chen, Danqian, Zhao, Yingyong and Sun, Shisheng; Recognition of Bisecting N-Glycans on Intact Glycopeptides by Two Characteristic Ions in Tandem Mass Spectra; *Analytical Chemistry*; 91 (2019); 5478-5482.
3. Zhu, Bojing, Shen, Jiechen, Zhao, Ting, Jiang, Haihai, Ma, Tianran, Zhang, Jie, Dang, Liuyi, Gao, Ni, Hu, Yingwei, Shi, Yi and Sun, Shisheng. Intact Glycopeptide Analysis of Influenza A/H1N1/09 Neuraminidase Revealing the Effects of Host and Glycosite Location on Site-Specific Glycan Structures. *Proteomics*. 2019;19(3).

Title:

StrucGP: De Novo Structural Sequencing of Site-specific N-Glycans on Glycoproteins Using a Modularization Strategy

Abstract:

Precision mapping of glycans at structural and site-specific level is still one of the most challenging tasks in the glycobiology field. Here, we describe a novel modularization strategy for de novo interpretation of N-glycan structures on intact glycopeptides using tandem mass spectrometry. A new algorithm named StrucGP is also developed to automate the interpretation process for large-scale analysis. By dividing an N-glycan into three modules and identifying each module using distinct patterns of Y ions or a combination of distinguishable B/Y ions, the method enables determination of detailed glycan structures on thousands of glycosites in mouse brain, which are comprised of four types of core structures and seventeen branch structures with three glycan subtypes. Owing to the database-independent glycan mapping strategy, StrucGP also facilitates the identification of rare/new glycan structures. The approach will be greatly beneficial for in-depth structural and functional study of glycoproteins in the biomedical research.

Keywords: Glycoproteomics, Glycan structure, Mass spectrometry, Glycosylation

