

# Liang Lin

## Curriculum Vitae

State Key Laboratory of Bioorganic and Natural Product Chemistry    Phone: 021-54925301  
Shanghai Institute of Organic Chemistry, CAS    Email: [lianglin@mail.sioc.ac.cn](mailto:lianglin@mail.sioc.ac.cn)  
345 Lingling Road, Shanghai, China 200032

## EDUCATION

- 2020/06-present    Professor, State Key Laboratory of Bioorganic and Natural Products Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences (Shanghai, China)
- 2015/11-2020/04    Postdoc in Biomedical Engineering, Northwestern University (IL, USA)
- 2010/09-2015/07    Ph.D. in Chemical Biology, Peking University (Beijing, China)
- 2006/09-2010/07    B.S. in Chemistry, Peking University (Beijing, China)

## RESEARCH EXPERIENCE

- 2015-2020    **Postdoc Research with Professor Milan Mrksich**  
Department of Biomedical Engineering, Northwestern University  
*Design of glycosylation sites by rapid expression and high-throughput characterization of polypeptide glycosyltransferases; Controllable engineering of sequential tetra-N-glycan modified proteins; Evolution of glycosyltransferases for orthogonal system identification, native therapeutic protein glycosylation and orthogonal site-specific glycosylation.*
- 2010-2015    **Graduate Research with Professor Xing Chen**  
Department of Chemical Biology, College of Chemistry and Molecular Engineering, Peking University  
*Carbon nanotube-assisted optical activation of proteins using near-infrared light; Surface enhanced Raman detection and imaging of cell surface glycans; Preparation and purification of N-glycans, O-glycans and gangliosides from cells for MS characterization and following Glycomics analysis; Atomic force microscopy analysis of cell-cell glycan exchange.*
- 2007-2010    **Undergraduate Research with Professor Yan Li**  
Institute of Inorganic Chemistry, College of Chemistry and Molecular Engineering, Peking University  
*Synthesis of carbon nanotube-supported uniform platinum nanoparticles at the aid of ionic liquid, and analysis of their catalytic performance in methanol oxidation; Cutting of single-walled carbon nanotubes; Chemical vapor deposition growth of single-walled carbon nanotubes.*

# Liang Lin

## Curriculum Vitae

### RESEARCH PROJECTS

1. Develop high-throughput experiments for protein evolution.
2. Fast enzyme screening and identification from bacterial community and fast evolution of enzymes for substrate selectivity / high activity, which are used for optimizing the key steps in drug syntheses and other useful enzymes.
3. Screen and identify beneficial evolution in Organisms for disease prevention and treatment (especially microbial infections, metabolic disorders and endocrine disorders).

### PUBLICATIONS

1. **Liang Lin**, Milan Mrksich. Landscapes in double-site saturation mutagenesis of *N*-glycosyltransferases and orthogonality identification. In preparation.
2. **Liang Lin**, Weston Kightlinger, Katherine Warfel, Michael C. Jewett, and Milan Mrksich. Using high throughput experiments to engineer *N*-glycosyltransferases with altered specificity. Submitted.
3. **Liang Lin**<sup>#</sup>, Weston Kightlinger<sup>#</sup>, Adam J. Hockenberry, Michael C. Jewett, and Milan Mrksich. Sequential glycosylation of proteins with substrate-specific *N*-glycosyltransferases. *ACS Central Science* **6**, 144-154 (2020).
4. Weston Kightlinger<sup>#</sup>, **Liang Lin**<sup>#</sup>, Madisen Rosztoczy, Wenhao Li, Matthew P. DeLisa, Milan Mrksich, and Michael C. Jewett. Design of glycosylation sites by rapid synthesis and analysis of glycosyltransferases. *Nature Chemical Biology*, **14**, 627-635 (2018).
5. **Liang Lin**<sup>#</sup>, Ling Liu<sup>#</sup>, Bing Zhao, Ran Xie, Wei Lin, He Li, Yaya Li, Minlong Shi, Ye-Guang Chen, Timothy A. Springer, and Xing Chen. Carbon nanotube-assisted optical activation of TGF- $\beta$  signalling by near-infrared light. *Nature Nanotechnology* **10**, 465-471 (2015).
6. **Liang Lin**<sup>#</sup>, Xiangdong Tian<sup>#</sup>, Senlian Hong<sup>#</sup>, Peng Dai, Qiancheng You, Ruyi Wang, Lianshun Feng, Can Xie, Zhongqun Tian, and Xing Chen. A bioorthogonal Raman reporter strategy for SERS detection of glycans on live cells. *Angewandte Chemie International Edition* **52**, 7266-7271 (2013). [Inside Cover]
7. Senlian Hong, **Liang Lin**, Ming Xiao, and Xing Chen. Live-cell bioorthogonal Raman imaging. *Current Opinion in Chemical Biology* **24**, 91-96 (2015).
8. Ming Xiao, **Liang Lin**, Zefan Li, Jie Liu, Senlian Hong, Yaya Li, Meiling Zheng, Xuanming Duan, and Xing Chen. SERS imaging of cell-surface biomolecules metabolically labeled with bioorthogonal Raman reporters. *Chemistry-an Asian Journal* **9**, 2040-2044 (2014).
9. José-Marc Techner, Weston Kightlinger, **Liang Lin**, Jasmine Hershewe, Ashvita Ramesh, Matthew P. DeLisa, Michael C. Jewett, and Milan Mrksich. High-throughput synthesis and analysis of intact glycoproteins using SAMDI-MS. *Analytical Chemistry* **92**, 1963-1971 (2020).
10. Haibin Chu, Yihong Shen, **Liang Lin**, Xiaojun Qin, Ge Feng, Ziyin Lin, Jinyong Wang,

# Liang Lin

## *Curriculum Vitae*

- Haichao Liu, and Yan Li. Ionic-liquid-assisted preparation of carbon nanotube-supported uniform noble metal nanoparticles and their enhanced catalytic performance. *Advanced Functional Materials* **20**, 3747-3752 (2010).
11. Benjamin Schumann, Stacy A. Malaker, Simon P. Wisnovsky, Marjoke F. Debets, Anthony J. Agbay, Daniel Fernandez, Lauren J. S. Wagner, **Liang Lin**, Zhen Li, Junwon Choi, Douglas M. Fox, Jessie Peh, Melissa A. Gray, Kayvon Pedram, Jennifer J. Kohler, Milan Mrksich, and Carolyn R. Bertozzi. Bump-and-hole engineering identifies specific substrates of glycosyltransferases in living cells. *Molecular Cell* **78**, 1-11 (2020).
  12. Weston Kightlinger, Katherine E. Duncker, Ashvita Ramesh, Ariel H. Thames, Aravind Natarajan, Jessica C. Stark, Allen Yang, **Liang Lin**, Milan Mrksich, Matthew P. DeLisa, and Michael C. Jewett. A cell-free biosynthesis platform for modular construction of protein glycosylation pathways. *Nature Communications* **10**, 5404 (2019).
  13. Jun Du, Senlian Hong, Lu Dong, Bo Cheng, **Liang Lin**, Bing Zhao, Ye-Guang Chen, and Xing Chen. Dynamic sialylation in transforming growth factor- $\beta$ -induced epithelial to mesenchymal transition. *Journal of Biological Chemistry* **290**, 12000-12013 (2015).

## PATENTS

1. Milan Mrksich, Michael C. Jewett, **Liang Lin**, Weston Kightlinger. USA Patent, 62545760. August 15<sup>th</sup>, 2017. "Design of protein glycosylation sites by rapid expression and characterization of *N*-glycosyltransferases"
2. Xing Chen, Zhongqun Tian, Xiangdong Tian, **Liang Lin**, Senlian Hong. China Patent, CL201210342478.3. March 26<sup>th</sup>, 2014.
3. Haibin Chu, Yan Li, Jinyong Wang, Ge Feng, **Liang Lin**, Ziyin Lin. China Patent, CL200810226843.8. April 29<sup>th</sup>, 2009.

## PRESENTATIONS

1. **Liang Lin**. Parallel screening and rapid identification of orthogonal glycosyltransferases. "2nd ANNUAL CONFERENCE Quantitative Approaches in Biology", Evanston, Illinois, USA, October 2019. (Oral & Poster)
2. **Liang Lin**. Parallel screening and rapid identification of orthogonal tetra-*N*-glycosyltransferases for glycoprotein engineering. "Central US Synbio Workshop 2019", Madison, Wisconsin, USA, September 2019. (Oral)
3. **Liang Lin**. Site-specific glycosylation of protein via *N*-glycosyltransferases with substrate orthogonality. "6th International Conference on Glycobiology, Lipid & Metabolic Disorders", Chicago, Illinois, USA, July 2019. (Oral)
4. **Liang Lin**. Engineering *N*-glycosyltransferases for whole substrate library with high-throughput mass spectrometry. "Chicago Mass Spec Day 2019", Chicago, Illinois, USA,

# Liang Lin

## *Curriculum Vitae*

July 2019. (Oral)

5. **Liang Lin.** Quantification analysis in site-directed mutagenesis of *N*-glycosyltransferases for peptide substrate library preference. “1st ANNUAL CONFERENCE Quantitative Approaches in Biology”, Evanston, Illinois, USA, November 2018. (Oral)
6. **Liang Lin,** Weston Kightlinger, Michael C. Jewett, Milan Mrksich. Using *N*-glycosyltransferases to control glycoprotein synthesis. “The 38th Midwest Enzyme Chemistry Conference”, Evanston, Illinois, USA, October 2018. (Poster)
7. **Liang Lin,** Ling Liu, Bing Zhao, Ran Xie, Wei Lin, He Li, Yaya Li, Xing Chen. Carbon nanotube-assisted optical activation of TGF- $\beta$  signaling by near-infrared light. “International Symposium on New Tools in Chemical Biology”, Beijing, China, December 2014. (Poster)
8. **Liang Lin,** Xiangdong Tian, Senlian Hong, Can Xie, Zhongqun Tian, Xing Chen. A new technique SERS to directly detect cell surface glycans with a Raman reporter. “The 8<sup>th</sup> National Conference on Chemical Biology”, Shanghai, China, September 2013. (Poster)