

**YANTING GUO**

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LinkedIn: <https://www.linkedin.com/in/yanting-guo-327172202/>**SUMMARY STATEMENT**

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- Chemist with 5 years of experience in analytical chemistry and biochemistry. Specialty lies on LC-MS-based label-free or TMT-based quantitative top-down proteomics method development and application.
- Solid interpersonal, coaching, and collaborative abilities on solving challenging problems
- Excellent ability to handle and prioritize multiple tasks/projects

**SKILLS & EXPERTISE**

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***General LC-MS/MS-based skills***

- Reversed-phase LC (RPLC); size-exclusion chromatography (SEC); ion exchange chromatography (IEX)
- Online chromatographic multidimensional separation (*e.g.*, high-pH/low-pH nano-RPLC)
- Hands-on experience on a bottom-up customized nano-RPLC/MS system setup and maintenance
- Hands-on experience on top-down 1D and 2D ultrahigh pressure LC (UPLC) system setup and maintenance
- Hands-on experience on Orbitrap Exploris 240 mass spectrometer cleaning and calibration

***LC-MS/MS-based quantitative top-down proteomics***

- Human and bacterial cell culture; sample preparation (*e.g.*, protein extraction) for top-down proteomics
- Label-free quantitation in complex biological samples (*e.g.*, *HeLa* cell lysate) using top-down proteomics
- Tandem mass tag (TMT)-based quantitation in complex biological samples using top-down proteomics
- Label-free and TMT-based proteome profiling (*e.g.*, TPP, SPROX) using top-down proteomics
- Top-down analysis on autoantibodies from Systemic Lupus Erythematosus (SLE) patients' plasma
- Top-down post-translational modifications (PTMs) analysis for complex biological samples

***LC-MS/MS-based quantitative bottom-up proteomics***

- Sample preparation (*e.g.*, protein extraction, digestion, desalting) for bottom-up proteomics
- Label-free quantitation in complex biological samples (*e.g.*, *HeLa* cell lysate) using bottom-up proteomics
- TMT-based quantitation in complex biological samples using bottom-up proteomics
- Label-free drug target identification platform based on size development (DTIPS)
- Bottom-up MS data acquisition using DDA and DIA

***Capillary electrophoresis mass spectrometry (CE-MS)-based proteomics***

- Hands-on experience on top-down proteomics analysis for sub-nanograms complex biological sample using spray-capillary-based CZE separation
- MD separation by coupling RPLC and spray-capillary-base CZE for top-down proteomics analysis
- Hands-on experience on droplet-based sample preparation for single cell top-down/bottom-up proteomics

***Large-scale proteomics data analysis and other skills***

- Experience on distinct proteomics software and program package:
  - Top-down: TopPIC Suite, Biopharma Finder, Proteome Discoverer, ProSight Lite, MASH Suite
  - Bottom-up: MS-GF+, MaxQuant
  - Others: Xcalibur, FreeStyle, GraphPad Prism, Python, Microsoft Office
- BCA assay, SDS-PAGE, GELFrEE, Western blot, UV-Vis spectroscopy
- Experience on lecturing and tutoring graduate/undergraduate researchers
- Excellent experience in preparation of research planning and organizing, protocols, and method transfer

**PROFESIONAL EXPERIENCE**

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Graduate research assistant, University of Oklahoma, Norman, OK

2021.05-present

Research summary: Development and application of high-throughput quantitative top-down proteomics using Tandem mass tag (TMT) labeling

- **Project 1: Development of a quantitative, top-down tandem-mass-tag (TMT) labeling approach**
  - A “filter-SEC” technique for low molecular weight (MW) protein enrichment (<35 kDa) limited protein precipitation during TMT labeling reaction
  - Top-down TMT labeling for quantitation of intact proteoforms in complex biological samples
- **Project 2: Optimization of top-down TMT-based quantification approach**
  - Optimized different protein-level TMT labeling reactions in complex biological samples
  - Limited production of incorrectly labeled side products for minimization of spectra complexity
  - >90% labeling efficiency with optimized TMT labeling conditions in complex sample
- **Project 3: Optimization of MS2 fragmentation energy for TMT-labeled intact proteins**
  - Optimized HCD fragmentation energies on Orbitrap Exploris 240 mass spectrometer for TMT-labeled intact proteoforms in complex sample
  - Achieved a balance between proteoform identification and quantification with optimized HCD
- **Project 4: Evaluation of Chromatographic Behavior for TMT-labeled Intact Proteoforms in Human Cell Lysate using Top-Down Proteomics**
  - Evaluated RPLC retention time differences between TMT-labeled intact proteins and non-labeled intact proteins in *HeLa* cell lysate
- **Project 5: Development of top-down TMT-based online 2D ultrahigh pressure high-pH/low-pH reversed-phase liquid chromatography-MS platform**
  - Coupling online 2D high-pH/low-pH RPLC with top-down TMT labeling for human cell lysate quantitative analysis
  - Characterization of +1000 proteoforms with microgram sample injection
- **Project 6: Quantitative analysis of autoantibodies from Systemic Lupus Erythematosus (SLE) patients' plasma sample using top-down proteomics**
  - Organic depletion for plasma low abundance proteins enrichment
  - Quantitative analysis of depleted plasma proteins using TMT-based quantitation approach
  - Separation of autoantibodies from SLE patients using online 2D RPLC system
  - Quantitative analysis of autoantibodies from SLE patients using TMT-based quantitation approach

Other projects summary:

- **Project 7: Development of a label-free drug target identification platform (DTIPS)**
  - Native size exclusion chromatography SEC successfully separated drug and drug-protein complex
  - Correlated drug elution profile and protein elution profiles for potential drug target identification
  - Developed a novel, unbiased, quantitative, and high-throughput drug target identification platform
- **Other projects:** Participated in 3 external collaboration projects and 7 internal research projects, providing supports on sample handling and/or top-down-based UPLC-MS analysis

**Graduate teaching assistant, University of Oklahoma, Norman, OK**

**2018.08-2021.05**

Teaching summary: lectured and tutored senior undergraduate students in Basic Physical Chemistry and Physical Chemistry I

- Instructed undergraduate students in various PCHEM laboratories and graded lab reports
- Recorded lecture videos during COVID-19 shutdown (still in use)

**Research mentorship, University of Oklahoma, Norman, OK**

**2019.09-present**

Research mentorship summary: Mentored/co-mentored 10 undergraduate students for experimental design and research presentations.

- 1 undergraduate research day (URD) award; 2 poster presentations and 6 oral presentations

## **SELECTED HONORS AND AWARDS**

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- Dodge Family Finishing Fellowship Spring 2023

- Lloyd E. Swearingen Scholarship Spring 2022
- Graduate student stipend at the 69th ASMS Annual Conference Fall 2021
- Best Poster Award at the 1st CASMS Virtual Conference Fall 2021
- The Provost's Certificate of Distinction in Teaching Fall 2020
- Outstanding Graduate Teaching Assistant Award Fall 2018
- Honors Graduate Spring 2018
- National Scholarships 2014-2018

### **PUBLICATIONS** (\**co-first authors*)

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1. **Yanting Guo**, Trishika Chowdhury, Meena Seshadri, Kellye A. Cupp-Sutton, Qingyu Wang, Dahang Yu, Si Wu. Optimization of Higher-Energy Collisional Dissociation Fragmentation Energy for Intact Protein-level Tandem Mass Tag Labeling. *Journal of Proteome*. (*Manuscript accepted*)
2. **Yanting Guo**, Dahang Yu, Kellye A. Cupp-Sutton, Xiaowen Liu, Si Wu. A Benchmarking Protocol for Optimized Protein-Level Tandem Mass Tag (TMT) Labeling for Quantitative Top-Down Proteomics. *MethodX*, 2022: 101873.
3. **Yanting Guo\***, Dahang Yu\*, Kellye A. Cupp-Sutton, Xiaowen Liu, Si Wu. Optimization of Protein-Level Tandem Mass Tag (TMT) Labeling in Complex Sample with Top-Down Proteomics. *Analytica Chimica Acta*, 2022, 340037.
4. **Yanting Guo\***, Xing Chen\*, Xuan Zhang, Shujin Pu, Xutong Zhang, Chengli Yang, Dali Li. Comparative studies on ZIF-8 and SiO<sub>2</sub> nanoparticles as carrier for immobilized  $\beta$ -glucosidase. *Molecular Catalysis*, 2018, 459: 1-7.
5. **Yanting Guo**, Samin Anjum, Zhitao Zhao, Kellye A. Cupp-Sutton, Si Wu. Recent Advances of Multidimensional separation in top-down proteomics. *Analytical Science Advances* (invited special issue entitled "Annual Reviews – Recent Advances in Analytical Sciences") (*Manuscript in preparation*)
6. **Yanting Guo**, Dahang Yu, Trishika Chowdhury, Kellye A. Cupp-Sutton, Si Wu. Quantitative Analysis of Intact Proteoform in Human Cell Lysate with Top-down Tandem Mass Tag (TMT) Labeling and Online High-pH/Low-pH Reversed-phase Liquid Chromatography. (*Manuscript in preparation*)
7. **Yanting Guo**, Zhitao Zhao, Trishika Chowdhury, Kellye A. Cupp-Sutton, Si Wu. Evaluation of Chromatographic Behavior for TMT-labeled Intact Proteoforms in Human Cell Lysate using Top-Down Proteomics. (*Manuscript in preparation*)
8. **Yanting Guo**, Zhe Wang, Dahang Yu, Kellye A. Cupp-Sutton, Si Wu. Drug Target Identification Platform based on Size (DTIPS). (*Manuscript in preparation*)
9. Zhitao Zhao, **Yanting Guo**, Lushuang Huang, Kellye A. Cupp-Sutton, Si Wu. Evaluation of Spray-Capillary-Based Capillary Electrophoresis Mass Spectrometry with Sub-nanograms Complex Sample using Top-Down Proteomics. (*Manuscript in preparation*)
10. Yu, Dahang, Zhe Wang, Kellye A. Cupp-Sutton, **Yanting Guo**, Qiang Kou, Kenneth Smith, Xiaowen Liu, and Si Wu. "Quantitative top-down proteomics in complex samples using protein-level tandem mass tag labeling." *Journal of the American Society for Mass Spectrometry* 32, no. 6 (2021): 1336-1344. (*Supplementary journal cover*)
11. Tra D Nguyen\*, Mahbobeh Lesani\*, Ines Forrest\*, Yunpeng Lan\*, Danya A Dean, Quentin MR Gibaut, **Yanting Guo**, Ekram Hossain, Marcela Olvera, Hannah Panlilio, Adwaita R Parab, Chaoyi Wu, Jean A Bernatchez, Robert H Cichewicz, Laura-Isobel McCall. Local phenomena shape backyard soil metabolite composition. *Metabolites*, 2020, 10(3): 86.
12. Sidra Naseer, Jie Ouyang, Xing Chen, Shujin Pu, **Yanting Guo**, Xuan Zhang, Dali Li, Chengli Yang. Immobilization of  $\beta$ -glucosidase by self-catalysis and compared to crosslinking with glutaraldehyde. *International journal of biological macromolecules*, 2020, 154: 1490-1495.
13. Jun Yi, Mulin Fang, **Yanting Guo**, Jie Liang Yuxian Dai, Zhan Ren, Mengyu Li, Hongtao Li, Daiwei Liao. The practical new-type patent of A New Intelligent Three-phase Air Purifier (*Patent No. CN206449746U*)

**SELECTED PRESENTATIONS (22 additional involved presentations)**

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1. **Yanting Guo**, Zhe Wang, Dahang Yu, Kellye A Cupp-Sutton, and Si Wu. Development of a novel drug target identification platform based on size (DTIPS). 67<sup>th</sup> ASMS Conference on Mass Spectrometry and Allied Topics, June 2- June 6, 2019 (*Oral presentation*)
2. **Yanting Guo**, Dahang Yu, Kellye A. Cupp-Sutton, Xiaowen Liu, Si Wu. Optimization of Protein-Level Tandem Mass Tag (TMT) Labeling in Complex Sample with Top-Down Proteomics. 17th USHUPO Virtual Annual Conference, March 3-8, 2021 (*Poster and oral presentation*)
3. **Yanting Guo**, Dahang Yu, Kellye A. Cupp-Sutton, Xiaowen Liu, Si Wu. Optimization of Quantitative Top-Down Proteomics in Complex Samples using Protein-Level Tandem Mass Tag (TMT) Labeling. 1st CASMS, August 9-13, 2021 (*Poster and oral presentation, selected as Best Poster award*)
4. **Yanting Guo**, Kellye A. Cupp-Sutton, Dahang Yu, Walter P. Galie, Kenneth Smith, Xiaowen Liu, Si Wu. Quantitative Analysis of Intact Plasma Proteome in Systemic Lupus Erythematosus (SLE) using protein-level TMT labeling and top-down proteomics. 69<sup>th</sup> ASMS Conference on Mass Spectrometry and Allied Topics, October 31- November 4, 2021 (*Poster and oral presentation*)
5. **Yanting Guo**, Kellye A. Cupp-Sutton, Si Wu. Top-down Proteomics for PTM Characterization. US HUPO 2022 One World, February 26 – March 2, 2022 (*Short course oral presentation*)
6. **Yanting Guo**, Kellye A. Cupp-Sutton, Dahang Yu, Walter P. Galie, Ken Smith, Xiaowen Liu, Si Wu. Investigation of Systemic Lupus Erythematosus (SLE) Biomarkers using Top-down TMT Labeling and Two-Dimensional High-pH/Low-pH Reversed Phase Liquid Chromatography Separation. 70<sup>th</sup> ASMS Conference on Mass Spectrometry and Allied Topics, June 5-9, 2022 (*Poster presentation*)

**EDUCATION**

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- B.S. Biotechnology, Nanjing University of Science and Technology, China** 2014.09-2018.05
- Advisor: Dali Li and Jun Yi
  - Thesis: Comparative studies on ZIF-8 and SiO<sub>2</sub> nanoparticles as carrier for immobilized  $\beta$ -glucosidase
- Ph.D. Biochemistry, University of Oklahoma, Norman, OK, USA** 2018.09-expected 2023.05
- Advisor: Si Wu
  - Thesis: TBD

**OUTREACH ACTIVITIES**

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1. Course developer and lecturer, OU Mini college for K-12 students “What is a protein?” Fall 2021
2. Poster Judge at the OK-LSAMP 27th Annual Research Symposium Fall 2021