Tong WU

U.S. Permanent Resident

Department of Chemistry, Temple University
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Education:

2017～2022 Temple University – Advisor: Hai-Lung Dai
Ph.D. in Analytical Chemistry (3.82/4.00)
Dissertation: Influence of environmental factors on molecular transport through bacterial membranes

2013～2017 Jilin University
Bachelor of Chemistry with Outstanding Graduates Honors in Chemistry

Experience:

2022-Present
Adjunct Research Assistant Professor

Department of Chemistry, Temple University
•Research on antibiotics resistance of bacteria using nonlinear optics
•Conducting experiments, analyzing data and writing papers

2017-2022
Research Assistant

Department of Chemistry, Temple University
Advisor: Dr. Hai-Lung Dai

•Quantitatively determine the lipid bilayer phase separation and permeability using second harmonic generation spectroscopy.
•Simulation and modeling of small molecule adsorption and uptake to deduce thermodynamic information.
•Monitor antimicrobial molecule adsorption and transport through bacteria double cell membrane changed by indole and gain a mechanistic understanding of the effect of indole on antibiotic efficacy
•Drafted protocol for and mentored one graduate and three undergraduates on bacteria or human cell culture and fluorescence measurements; Provided technical support to other labs using our platforms

2015-2017
Research Assistant

State Key Laboratory of Supramolecular Structure and Materials, Institute of Theoretical Chemistry, Jilin University
Research Advisor: Dr. Weiqing Xu

•Senior Research Thesis: Rapid detection of enzymatic hydrolysis reaction or pesticide residues using surface-enhanced Raman Spectroscopy and Microfluidics

(Advisor: Weiqing Xu)

•Designed and fabricated Y-junction microfluidic chip for trace concentration detection

•Synthesis Au/Ag spherical nanoparticle in different sizes and functionalize surface with peptide and Ag nanoparticles.

•Performed statistical analysis on data sets using Origin

Publications:

1. **Wu, T.,** Wilhelm, M. J., Ma, J., Li, Y., Wu, Y., & Dai, H. L. Influence of Phase Transitions on Diffusive Molecular Transport Across Biological Membranes. *Angewandte Chemie - International Edition 61, (2022). (IF:16.82)*
2. **Wu, T.,** Wilhelm, M. J., Li, Y., Ma, J. & Dai, H.-L. Indole Facilitates Antimicrobial Uptake in Bacteria. *ACS Infect Disease 8, 1124–1133 (2022).* [cover page feature article] *(IF: 5.084)*
3. Wilhelm, M. J., Sharifian Gh, M., **Wu, T.,** Li, Y., Chang, C. M., Ma, J., & Dai, H. L. Determination of bacterial surface charge density via saturation of adsorbed ions. *Biophysical journal, 120(12), 2461–2470, (2021).* [cover page feature article] *(IF: 4.033)*
4. Yang, L., **Wu, T.,** Fu, C., Chen, G., Xu, S., and Xu, W. SERS determination of protease through a particle-on-a-film configuration constructed by electrostatic assembly in an enzymatic hydrolysis reaction. *RSC Advances* 6: 90120–90125, (2016). *(IF: 4.036)*

Under Peer Review:

5. **Wu, T.,** Wilhelm, M.J., Ma, J., Li, Y., and Dai, H.-L. Temperature effects on the permeability of living bacteria.
6. **Wu, T.,** Wilhelm, M.J., Ma, J., Li, Y., Wu, Y., and Dai, H.-L. Asymmetry in the leaflets of the liposome membrane of *E. coli* lipid extract: structure, phase transition, and molecular adsorption
7. **Wu, T.,** Chernikov, V., Lamb, G., Wang, Y., and Dai, H.-L. Auto-Mechanic Extruder for Liposome and Lipid-nanoparticle Preparation.
8. **Wu, T.,** Wilhelm, M.J., Li, Y., and Dai, H.-L. Protocol for quantifying molecular interactions at the membrane surfaces of bacteria: Passive transport and saturated adsorption. STAR Protocols. (Invited Paper)

Conference & Seminar Experiences:

2022 **ACS Spring** (Division of Colloid and Surface Chemistry)
Talk title: Indole facilitates antimicrobial transport across the bacterial peroplasm and cytoplasmic membrane

2021 **Merck West Point Outreach** Event
Seminar title: Molecular adsorption and transport at living cell membranes by Second Harmonic Scattering.

2021 **Original Research Proposal**
RNA-guided Cas9 Dynamics – A Study by Time-Resolved Second Harmonic Generation

2020	Attend **19th American Chemical Society's Younger Chemists Committee (YCC)** Philadelphia **Poster:** Extracellular Signaling Molecule Indole Increases Permeability of Bacterial Membranes (**Wu, T.,** Wilhelm, M.J., Ma, J., Li, Y., and Dai, H.-L.)
2019	Department of Chemistry Temple University **Seminar:** Identification of Transmembrane Asymmetry of Plasma Membrane Cholesterol by novel biosensors
2016	Attend **1st National Conference on Raman-based Biomedical Application** at Wuhan University, in China. **Poster:** SERS determination of protease through a particle-on-a-film configuration constructed by electrostatic assembly in enzymatic hydrolysis reaction. (Yang, L., **Wu, T.,** Fu, C., Chen, G., Xu, S., and Xu, W.)

Teaching & Supervising Experiences:

2021 Summer *Instructor*	General Chemistry II Recitation (1032) General Chemistry II Laboratory (1034)
2020	**Team advisor** in senior design project (Temple' 20) Design Title: Auto Mechanic Extruder for lipid nano particle preparation • Drafted proposal and **granted $1500**. • Invented and constructed a faster, stable, electronically controlled Extruder for liposome preparation.
2018 *Instructor*	General Chemistry I Laboratory (1033) Temple University, Department of chemistry
2017 *Instructor*	Introduction to chemical research techniques (3105) Temple University, Department of chemistry

Professional skills:

Scientific techniques	*Spectroscopy:* Second Harmonic Generation; UV-Vis; Fluorescence *Microscopy:* Nonlinear Microscopy; Optical Microscopy; Fluorescence Microscopy Flow Cytometry; Fluorometer; DLS Cell Culture; Liposome Ensemble
Computer system	Office pack; Origin; Igor; Wolfram Mathematica; Python; ChemDraw;
Languages	Mandarin; English

Internship Experiences:

2016 Summer	**Surfactant Research Laboratory in Fushun Petrochemical Branch Institute** Classified and analyzed surfactant materials

Extracurricular Activities:

2013-2016 Associate President	**Student Union of Department of Chemistry** Assists the Chair in coordinating advocacy efforts on behalf of student interests. Organized festivals and events to enrich student's campus lives.
2014-2015 Psychological Counselor	**Peer Mental Health Association, College of Chemistry, Jilin University** Organized various seminars on mental health and stress management for freshman.
2014 Volunteer teacher	**Supporting Education in Longshan County, Hunan Province** Arranged emergency preparedness activities to respond to disasters. Taught nature science class.
2013-2015 Treasurer	**Tedx in Jilin University** Responsible for seeking corporate sponsorship Handles the society's finances

Awards & Honors:

2022	Dissertation Grant Fellowship, $11,000 from Temple Dept. of Chemistry
2021	2nd Place in Fall 2020 Top Senior Design Team Competition, Temple College of Engineering
2020	Best Poster, ACS Philadelphia Section 2020 Expo & Younger Chemists Committee Annual Meeting
2017	Outstanding Graduates of Jilin University
2017	Individual Scholarship of Jilin University
2016	Excellent Psychological Counselor of Jilin University
2016	The First Prize Scholarship of Jilin University
2015	Advanced Individual in College of Chemistry of Jilin University
2015	The First Prize Scholarship of Jilin University
2014	Excellent Student Cadre Scholarship of Jilin University
2014	The Second Prize Scholarship of Jilin University