

# Tong WU

U.S. Permanent Resident

Department of Chemistry, Temple University  
203 Beury Hall, 1901 N. 13th Street, Philadelphia, PA 19122, USA  
+1 267-902-4330  
tong.wu@temple.edu

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## Education:

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| <b>2017~2022</b> | Temple University – Advisor: Hai-Lung Dai<br><b>Ph.D.</b> in Analytical Chemistry (3.82/4.00)<br>Dissertation: Influence of environmental factors on molecular transport through bacterial membranes |
| <b>2013~2017</b> | Jilin University<br>Bachelor of Chemistry with Outstanding Graduates Honors in Chemistry   |
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## Experience:

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| <b>2022-Present</b><br><i>Adjunct Research Assistant Professor</i> | Department of Chemistry, Temple University <ul style="list-style-type: none"><li>• Composed journal papers and grant applications</li><li>• Developed advanced analytical methods and techniques to study antibiotic metabolism</li></ul>   |
| <b>2017-2022</b><br><i>Research Assistant</i>                      | Department of Chemistry, Temple University<br>Advisor: Dr. Hai-Lung Dai <ul style="list-style-type: none"><li>• Quantitatively determine the lipid bilayer phase separation and permeability using second harmonic generation spectroscopy.</li><li>• Developed mathematical models for drug metabolism, aiding in data analysis for technical applications</li><li>• 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</li><li>• 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</li></ul> |
| <b>2015-2017</b><br><i>Research Assistant</i>                      | State Key Laboratory of Supramolecular Structure and Materials, Institute of Theoretical Chemistry, Jilin University<br>Research Advisor: Dr. Weiqing Xu  |

- Focused on rapid detection and analysis using surface-enhanced Raman Spectroscopy and microfluidic technologies for various applications
- Expertise in designing, fabricating, and testing microfluidic chips for efficient trace concentration detection
- Utilized statistical methods and software tools to analyze and interpret experimental data to advance microfluidic based detection

## 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:

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| <b>2022</b> | <b>ACS Spring</b> (Division of Colloid and Surface Chemistry)<br>Talk title: Indole facilitates antimicrobial transport across the bacterial periplasm and cytoplasmic membrane |
| <b>2021</b> | <b>Merck West Point Outreach</b> Event<br>Seminar title: Molecular adsorption and transport at living cell membranes by Second Harmonic Scattering.                             |
| <b>2021</b> | <b>Original Research Proposal</b><br>RNA-guided Cas9 Dynamics – A Study by Time-Resolved Second Harmonic Generation   |
| <b>2020</b> | Attend <b>19th American Chemical Society's Younger Chemists Committee (YCC)</b><br>Philadelphia   |

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- 2019** **Poster:** Extracellular Signaling Molecule Indole Increases Permeability of Bacterial Membranes (**Wu, T.**, Wilhelm, M.J., Ma, J., Li, Y., and Dai, H.-L.)  
Department of Chemistry Temple University
- 2016** **Seminar:** Identification of Transmembrane Asymmetry of Plasma Membrane Cholesterol by novel biosensors  
Attend **1<sup>st</sup> 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.)
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### Teaching & Supervising Experiences:

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- 2021 Summer** General Chemistry II Recitation (1032)  
*Instructor* 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** General Chemistry I Laboratory (1033)  
*Instructor* Temple University, Department of chemistry
- 2017** Introduction to chemical research techniques (3105)  
*Instructor* Temple University, Department of chemistry
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### Professional skills:

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- Scientific techniques** Microfluidics, Dynamic light scattering (DLS), Differential Scanning Calorimetry (DSC), Optical/Fluorescence/Nonlinear Optical Microscopy, Flow cytometry, UV-Vis, HPLC, Mass Spectroscopy (MS), Bacteria/Human cell culture, Nano-lipid particle formation, Raman Spectroscopy
- Computer system** Proficient in Python, Latex, Microsoft Package, Wolfram Mathematica, WaveMetrics Igor, ImageJ, ChemDraw; Experience with MATLAB, Origin, C, CUDA, Google Colab
- Languages** Mandarin/Chinese; English
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### Internship Experiences:

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

**Extracurricular Activities:**

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

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**Awards & Honors:**

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