PENGHSUAN (TIMO) HUANG

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PROFESSIONAL SUMMARY

Analytical PhD chemist with 9+ years of advanced mass spectrometry experience across ADCs, proteomics, glyco/phospho-PTMs, and small molecule characterization. Proven expertise in therapeutic protein characterization, biomarker discovery, and analytical method development in academic and industrial settings. Published researcher with 5 first/co-first and 10+ co-author papers in high-impact journals (Nature Methods, Nature Communications, ACS Central Science, Analytical Chemistry).

***US work authorization: No sponsorship required.** Able to relocate. ***

TECHNICAL SKILLS

MS Platforms: Bruker TimsToF flex MALDI-2, MALDI-TOF/TOF, Thermo Orbitrap Fusion Lumos/Exploris/Eclipse, MALDI-MSI, DESI-MSI, ion mobility-mass spectrometry, SCIEX ZenoTOF 8600

Chromatography & Sample Prep: UHPLC-MS/MS, IEX chromatography, tissue cryosection, H&E staining, microscopy

Quantitative Omics: Bottom-up/middle-down/top-down proteomics, lipidomics, ADC/mAb/bsAb characterization, intact mass analysis, charge variant characterization, isobaric tag quantitation, DIA/DDA analysis (diaPASEF/ddaPASEF)

Data Analysis: MaxQuant, DIA-NN, Proteome Discoverer, Byonic, FragPipe, ProSight Native, Protein Metrics, Skyline, MS-DIAL, R, Python, MATLAB, GraphPad Prism

PROFESSIONAL EXPERIENCE

Regeneron Pharmaceuticals, Inc. — Analytical Chemistry Group | Tarrytown, NY

PhD Internship | May 2025 – Aug 2025 | Mentors: Tao Xing, Yuetian Yang, Shunhai Wang

- Developed and executed online electrochemical reduction method coupled with IEX separation for middle-down mAb analysis and mAb charge variant profiling.
- Optimized MS/MS fragmentation methods(EThcD and PTCR) to increase sequence coverage and localize site-specific PTMs on CDR regions of mAbs, directly supporting candidate characterization workflows.

SELECTED PUBLICATIONS & PATENT

5 First/Co-First Author, 10+ co-author publications, 4 review papers | Full list: Google Scholar | ORCID: Penghsuan Huang

- **Huang, P.**; Sardina, J.; Lu, H.; Currie, C.R.; Li, L. Proteome-wide analysis and surface protein isolation for secretome characterization: leaf-cutter ant *Acromyrmex echinatior*. *Analytical Chemistry* **2025**, *97* (51), 28281-28291. Supp. Cover
- **Huang, P.**; Zhang, H.; Liu, Y.; Li, L. Rapid Characterization of Phospholipids using ITO-Coated Slide Assisted Enrichment MALDI Mass Spectrometry. *Analysis & Sensing* **2024**, *4* (3). link
- **Huang, P.**; Huang, C. Y.; Lin, T. C.; Lin, L. E.; Yang, E.; Lee, C.; Hsu, C. C.; Chou, P. T. Toward the Rational Design of Universal Dual Polarity Matrix for MALDI Mass Spectrometry. *Analytical Chemistry* **2020**, *92* (10), 7139-7145. link

Patent: Hsu, C.-C.; Chou, P.-T.; Lee, C.; **Huang, P.**; et al. Use of Anthranilic Acid Derivative as Matrix for MALDI Mass Spectrometry. US20210066060A1 (2021). link | **Additional:** 4 oral & 8 poster conference presentations

EDUCATION

University of Wisconsin–Madison | PhD Candidate in Chemistry (Expected: May 2026) | Advisor: Prof. Lingjun Li

National Taiwan University | Bachelor of Science in Chemistry (June 2020) | Advisor: Prof. Cheng-Chih Richard Hsu

RESEARCH EXPERIENCE

University of Wisconsin–Madison | Jan 2022 – Present | Graduate Research Assistant

ADC Characterization & Targeted Protein Degradation Analysis

- Performed isobaric tagging-based quantitative proteomics to validate the efficacy of multiple RIPK1-targeting degraders across cell lines, contributing to a publication in *Journal of Medicinal Chemistry*.

- Optimized MS methods for intact mass characterization of antibody-drug conjugates (ADC) incorporating DBCO-PEG_3-NHS ester and azido-PEG linkers, supporting studies published in *Nature Communications* and *Angewandte Chemie*.
- Developed and implemented top-down MS workflows for intact mass characterization and site-specific identification of NHS-PEG_{12}-azide labeling on lysosome-targeting chimeras (LYTACs), contributing to a publication in *Advanced Science*.

MS Structural Elucidation (Metabolites, Lipids, and Glycans)

- Established FFPE / fresh-frozen tissue extraction workflows for LC-MS-based structural elucidation of metabolites, lipids, and glycans; built an in-house spectral library supporting publications in *Nature Methods* and *Nature Communications*.
- Adapted and applied the spectral library for on-tissue *in situ* MALDI-IM-MS/MS chemical structural elucidation.

Proteome-Wide Analysis and Surface Protein Isolation for Secretome Characterization

- Developed and validated advanced data-independent acquisition methods (diaPASEF/ddaPASEF) for comprehensive proteome profiling and quantification to understand developmental biology and biomineralization process.
- Established novel surface-bound protein isolation protocol enabling secretome characterization and biomarker identification for protein-protein interaction analysis and GO enrichment to translate MS data into mechanistic insights.

Rapid Characterization of Phospholipids Using ITO-Coated Slide Enrichment

- Designed and optimized high-throughput phospholipid enrichment method using ITO-coated slides, improving sample screening capacity for LC-MS/MS and MALDI-IM-MS.
- Developed and optimized MALDI-2 with ion mobility MS on Bruker TimsToF flex for accurate lipid identification and structural characterization.

National Taiwan University | July 2018 – Feb 2021 | Undergrad Research Assistant & Full-time Scientist

Toward the Rational Design of Universal Dual Polarity Matrix for MALDI MS

- Designed and synthesized novel dual-polarity MALDI matrices enabling both positive and negative ion detection from single sample preparation with optimized matrix performance across multiple tissue sample types.
- Applied for and received US patent (US20210066060A1, 2021) based on novel matrix technology.

SCIENTIFIC LEADERSHIP & MENTORSHIP

Instrument Manager & Scientific Leader | Li Research Lab, UW-Madison | Mar 2022 – Present

- Managed Bruker TimsToF fleX: routine maintenance, user training, technical troubleshooting for 10+ lab members.
- Mentored 2 graduate students through research project completion: guided experimental design and supported manuscript preparation; wrote and maintained standard operating procedures (SOPs) for the MS instrument.

Co-Organizer | Wisconsin HUPO 2024 & IMSIS 2024 | Trainee Organizing Committee

- Co-led logistics/coordination for scientific conferences; engaged 100+ attendees and cross-institutional collaborators.

Team Leader | 2019 Winter Chemistry Camp, National Taiwan University | Sept 2018 – Feb 2019

- Organized educational programming for 100+ high school students; arranged hands-on chemistry experiments and visits to *Academia Sinica* (Taiwan) research facilities.

Analytical/General Chemistry Course Teaching Assistant | UW-Madison Department of Chemistry | Sept 2021 – June 2023

- Instructed and mentored 40–60 students per semester in lab practices, analytical techniques, and data analysis.
- Prepared and delivered weekly discussion sections on problem-solving and experimental design; Instructed and explained course materials and problem sets; Instructed group project lab; provided one-on-one consultation.

FELLOWSHIPS & AWARDS

Travel Grant, **GSFLC, UW–Madison** (Apr 2025); Educational Grant, **MSACL** (Mar 2024); Student Research Grant & Conference Funds, **UW–Madison** (Mar 2024); **LCY Group** College Student Research Award (Mar 2021); **Suu-Nien Fu Thesis Award**, 1st Place, **NTU** (Jun 2020); Outstanding Undergraduate Poster Award, **NTU** (Jun 2020); Travel Grants, **TSMS & NTU** (Feb, May 2020); Young Scientist Forum Best Presenter, **8th AOMSC** (Jan 2020).