Teng-Jui Lin

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Education

University of California, Berkeley | *Berkeley, CA, USA* **Aug 2023 - Present**

- Ph.D. student, Chemical and Biomolecular Engineering

University of Washington | *Seattle, WA, USA* **Sep 2019 - Jun 2023**

- B.S. in Chemical Engineering: Nanoscience and Molecular Engineering, *summa cum laude*
- Minor in Applied Mathematics and Chemistry
- Focus Area on Bio & Biomedical Materials, Interfaces, and Systems
- Honors Thesis: Quantifying Microglia Morphological Response to Injury and Treatment Across Species with Unsupervised Machine Learning
- Industry Capstone: Characterization of Silica-Based Anion Exchange Resin for Acid Mine Drainage

Kinglee High School | *Zhengzhou, Henan, China* **Sep 2013 - Jun 2019**

Research Experience

Graduate Student Researcher **Oct 2023 - Present**

Department of Chemical and Biomolecular Engineering, UC Berkeley, PI: Markita Landry

Undergraduate Research Assistant **Nov 2020 - Jun 2023**

Department of Chemical Engineering, University of Washington, PI: Elizabeth Nance

- Developed 80% more efficient Python application programming interface for morphological analysis and modular integration to immunofluorescent image analysis workflow
- Quantified microglia morphology in neuroinflammatory rat and ferret oxygen-glucose deprivation models and healthy mouse, rat, ferret, rabbit, and pig models (427,000+ cells) with immunofluorescent image processing and unsupervised machine learning
- Analyzed number of publications that used immunofluorescent images at 450+ combinations of variables using PubMed web scrapping in Python, 93% more efficient than manual search
- Tile-scanned 12 murine breast cancer tissue slices using confocal microscope (24.5 hr)

Summer Undergraduate Research Scholar **Jun 2022 - Aug 2022**

NSF Science and Technology Center on Real-Time Functional Imaging (STROBE)

Department of Physics, Florida International University, PI: Jin He

- Fabricated, functionalized, and surface-modified gold nanorods improving tissue conductivity
- Characterized gold nanorods using UV-Vis spectroscopy and Raman spectroscopy
- Measured contractile force of cardiac tissues by analyzing brightfield microscopy video data and processed confocal microscopy images of cardiomyocytes with Python

Honors & Awards

Annual Dean's Lists | *University of Washington* **2020 - 2023**

Library Research Award for Undergraduates | *University Libraries, University of Washington* **2023**

Nominee, Dean's Medal for Academic Excellence | *College of Engineering, University of Washington* **2023**

Poster Competition 2nd Place | *American Institute of Chemical Engineers* **2022**

Conference Travel Award | *Undergraduate Research Program, University of Washington* **2022**

Future Leader in ChemE | *Dept. of Chemical and Biomolecular Engineering, NC State University* **2022**

Dan Evans Term Scholarships | *Dept. of Chemical Engineering, University of Washington* **2021 & 2022**

ChemE Hackathon Team 1st Place | *Dept. of Chemical Engineering, University of Washington* **2022**

Mary Gates Research Scholarship | *Mary Gates Endowment for Students, University of Washington* **2021**

ChemE Hackathon Team 3rd Place | *Dept. of Chemical Engineering, University of Washington* **2021**
Discovery Fair 1st Place | *Kinglee High School* **2019**
Peer Tutor Award | *Kinglee High School* **2019**
Science Fair Award 2nd Place | *Kinglee High School* **2018**
Peer Tutor Award | *Kinglee High School* **2018**
Merit Student of Zhengzhou City | *Zhengzhou Municipal Education Bureau* **2018**
Science Fair Award 1st Place | *Kinglee High School* **2017**

Publications

Corresponding Author*

1. H. Helmbrecht, **T.-J. Lin**, S. Janakiraman, K. Decker, E. Nance*. Prevalence and Practices of Immunofluorescent Cell Image Processing: A Systematic Review. *Frontiers in Cellular Neuroscience* (2023). DOI: 10.3389/fncel.2023.1188858.

Presentations

Presenting Author^

Oral Presentations

4. **T.-J. Lin**^, G. Charpentier^, L. Miller^, M. Gokani^, M. Nelson^, B. Rutz, O. Lenz. Characterization of silica-based anion exchange resin for acid mine drainage. *Material Science and Engineering & Chemical Engineering Capstone Symposium, University of Washington, Seattle, WA, USA*. 2 Jun 2023.
3. H. Helmbrecht^, E. Nance, K. Decker, **T.-J. Lin**, S. Janakiraman, M. Onodera. Analysis of microglia morphology across different Nnuroinflammatory rat models. *AIChE Annual Meeting, Phoenix, AZ, USA*. 13 Nov 2022. Link.
2. **T.-J. Lin**^, H. Helmbrecht, E. Nance. Incorporating Visually Aided Morpho-Phenotyping Image Recognition into robust microglial shape analysis. *Undergraduate Research Symposium, University of Washington, Seattle, WA, USA*. 20 May 2022. Link.
1. **T.-J. Lin**^, H. Helmbrecht, E. Nance. Robust microglial shape analysis using Visually Aided Morpho-Phenotyping Image Recognition. *AIChE Pacific Northwest Student Regional Conference, Seattle, WA, USA*. 23 Apr 2022.

Poster Presentations

7. **T.-J. Lin**^, G. Charpentier^, L. Miller^, M. Gokani^, M. Nelson^, B. Rutz, O. Lenz. Characterization of silica-based anion exchange resin for acid mine drainage. *Material Science and Engineering & Chemical Engineering Capstone Symposium, University of Washington, Seattle, WA, USA*. 2 Jun 2023.
6. **T.-J. Lin**^, H. Helmbrecht, R. Jin, T. Wood, E. Nance. Assessing separate and combinatorial treatments in neuroinflammatory preterm ferret model by quantifying microglia and oligodendrocyte morphology. *Undergraduate Research Symposium, University of Washington, Seattle, WA, USA*. 19 May 2023. Link.
5. **T.-J. Lin**^, H. Helmbrecht, R. Jin, T. Wood, E. Nance. Assessing separate and combinatorial treatments in neuroinflammatory preterm ferret model by quantifying microglia and oligodendrocyte morphology. *AIChE Pacific Northwest Student Regional Conference, Corvallis, OR, USA*. 15 Apr 2023.
4. **T.-J. Lin**^, H. Helmbrecht, E. Nance. Quantifying microglia morphology across neuroinflammatory rat models with unsupervised machine learning. *Southern California Conference for Undergraduate Research, Malibu, CA, USA*. 19 Nov 2022. Link.
3. **T.-J. Lin**^, H. Helmbrecht, E. Nance. Quantifying microglia morphology across neuroinflammatory rat models with unsupervised machine learning. *AIChE Annual Student Conference, Phoenix, AZ, USA*. 13 Nov 2022. Link.
2. **T.-J. Lin**^, H. Helmbrecht, E. Nance. Quantifying microglia morphology across neuroinflammatory rat models with unsupervised machine learning. *Future Leaders in Chemical Engineering Award Symposium, North Carolina State University, Raleigh, NC, USA*. 24 Oct 2022. Link.

1. **T.-J. Lin**^, A. Rubfiaro, G. Ghimire, J. He. Fabrication and characterization of functionalized gold nanorods for improving engineered cardiac tissue maturation. *Center for Diversity and Student Success Summer Research Symposium, Florida International University, Miami, FL, USA*. 29 July 2022.

Mass Media Appearances

2. (Insights letter) A. Heim, T. Bharani, N. Konstantinides, J. Powell, S. Srivastava, X. Cao, D. Agarwal, K. Waiho, **T.-J. Lin**, E. Virgüez, W. Strielkowski, A. Uzonyi. AI in search of human help. *Science*. 381, 162-163 (2023). DOI: 10.1126/science.adi8740
1. (Insights letter) R. Tang, T. Bharani, J. Ding, K. Li, J. Wen, S. D. Gopinath, **T.-J. Lin**, J. X. J. Luo, Q. Wen, K. Davis, N. van Rhijn, Name withheld, S. M. Anderson, R. J. Patel, S. Sarnala, F. S. Oda, G. Singh, N. R. Kothapalli, N. Scott, J. R. Powell, S. N. Kirshner. When internships disappoint. *Science*. 378, 22–24 (2022). DOI: 10.1126/science.ade6397.

Teaching Experience

Open-Source Chemical Engineering Education (Link) **Jan 2021 – Present**

- Equation sheets of >20 courses in chemical engineering, applied mathematics, physics, and chemistry.
- Scientific computing workbook of 2 courses in chemical engineering and applied mathematics
- Course notes of 15 courses in chemical engineering, applied mathematics, physics, and chemistry
- Instructional videos (YouTube, Bilibili) with accompanying slides in process dynamics and control, process design, and surface and colloid science with >30 videos at >8000 total views and >100 stars

Graduate Student Instructor,
CHM ENG 130: Mathematics and Statistics in Chemical Engineering **Aug 2023 - Dec 2023**

Department of Chemical and Biomolecular Engineering, UC Berkeley, Instructor: Aditi Krishnapriyan

- Designed and instructed 13 computational lab sections and assignments for >50 students
- Formulated problems in 3 exams and 4 homework, responded student questions online

Teaching Assistant, CHEM E 455: Surface and Colloid Science Laboratory **Mar 2023 - Jun 2023**

Department of Chemical Engineering, University of Washington, Instructor: John Berg

- Instructed 3 sections/week for 8 different labs and graded 20 lab reports and 30 final presentations
- Instructed usage of densitometer, microplate reader, BET surface area analyzer, inverted microscope, and conductivity meter

Teaching Assistant, Advanced Placement (AP) Calculus AB **Sep 2018 - May 2019**

Kinglee High School, Instructor: Ben Trey

- Lectured 4 hours/week to 5 students in alignment with CollegeBoard-certified AP Calculus AB curriculum with interactive classroom activities to clarify complex concepts and common confusions
- Designed and graded bidaily concept checks, homework, and quizzes with tight deadlines under supervision

Professional Experience

Member, Industry Capstone Project Team **Jan 2023 - Jun 2023**

Department of Chemical Engineering, University of Washington

Membrion, Inc.

- Characterized and compared adsorption performance of anion exchange resins with a competitor by designing equilibrium experiments at standard conditions and after exposure to oxidizers and foulants
- Analyzed and visualized concentration-time profiles, adsorption isotherms, and effect of oxidizers and foulants on adsorption of ceramic ion exchange resins with Python

Service

Note Taker **Aug 2023 – Dec 2023**

Disabled Students' Program, UC Berkeley

- Organized detailed notes for >60 lectures of 2 core ChemE courses of Thermodynamics and Kinetics

Chemical Engineering Peer Mentor **Mar 2023 – Jun 2023**

Department of Chemical Engineering, University of Washington

- Facilitated coordination of Sophomore Welcome Event facing to 80+ students to form a cohort community.
- Led individual and group meetings with 6 ChemE sophomore mentees to discussed challenging concepts, learning strategies, and future goals, cultivating an inclusive campus climate for student success.

Undergraduate Representative, Faculty Search Committee **Jan 2023 – Feb 2023**

Department of Chemical Engineering, University of Washington

- Interviewed 5 faculty candidates with committee members and attended candidate research seminars to assess research vision, teaching, mentoring, collaboration potential, and diversity, equity and inclusion efforts.

Undergraduate Research Leader **Sep 2022 – Jun 2023**

Undergraduate Research Program, University of Washington

- Engaged 120+ students with diverse backgrounds from 6 first-year interest groups through interactive outreach presentations and served on a panel interfacing with 50+ students

Webmaster **Apr 2022 – Jun 2023**

American Institute of Chemical Engineers (AIChE), University of Washington

- Designed, managed, and updated official website and social media interfacing with 200+ students
- Facilitated coordination of ChemE BBQ event and graduation ceremony with 300+ cumulative engagement

Secretary **May 2021 – Jun 2023**

Women in Chemical Engineering, University of Washington

- Composed biweekly newsletters to 400+ members for diversity-oriented events, resources, and highlights
- Facilitated coordination of major events 300+ cumulative student and faculty engagement: Annual Industry event, Veteran's Day event, Wiki-edit-a-thon, International Women's Day event, and monthly general meetings

Research and Development Officer **Apr 2020 – Jun 2021**

Chinese Students and Scholars Association, University of Washington

- Designed, crafted, and edited posters and videos for major events with average 100+ student engagement
- Assisted in maintenance of official blog and website to provide academic resources for student success

Maple Hall Council Sustainability Representative **Oct 2019 – Mar 2020**

Housing and Food Services, University of Washington

- Led weekly committee meetings of 10 people and planned campus-wide waste-sorting competition
- Liaised sustainability feedback and initiatives through weekly hall council and sustainability group meetings

Peer Tutor of Math, Science, and English **Sep 2016 – Jun 2019**

Kinglee High School

- Taught active reading and note-taking strategies to English as a second language (ESL) students
- Reviewed course notes, clarified complex concepts, and provided feedback for course assignments
- Received 2 Peer Tutor Awards in recognition of outstanding contribution to the peer tutoring program

Student Council Historian and Secretary **Oct 2017 – Jun 2019**

Kinglee High School

- Prepared, coordinated, and executed activities, including Halloween activities, Thanksgiving Bonfire Nights, Christmas celebrations, Spirit Weeks, and Academic Integrity Seminar
- Drafted, edited, and updated activity proposals and meeting minutes for iterative improvement of execution
- Raised 1000+ CNY funds and 200+ books for children in need with fundraising events

Peer Mentor for Laboratory Practices **Mar 2017 – Mar 2019**

Kinglee High School

- Directed biology, chemistry, and physics lab practices of 9th-grade students for Zhongzhao Examination
- Taught lab safety guidelines, standard lab procedures, and best practices; ensured lab safety

References

Markita Landry | **landry@berkeley.edu**
Department of Chemical and Biomolecular Engineering, UC Berkeley
Associate Professor

Elizabeth Nance | **eanance@uw.edu**
Department of Chemical Engineering, University of Washington
Jagjeet and Janice Bindra Endowed Career Development Associate Professor
ChemE Associate Chair for Undergraduate Studies

Jim Pfaendtner | **wjpfaend@ncsu.edu**
Department of Chemical and Biomolecular Engineering, North Carolina State University
Professor
Louis Martin-Vega Dean of Engineering

John Berg | **spc@uw.edu**
Department of Chemical Engineering, University of Washington
Rehnberg Chair Professor

Alex Prybutok | **prybutok@uw.edu**
Department of Chemical Engineering, University of Washington
Assistant Teaching Professor