HAO LIU

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EDUCATION

PhD in Chemistry *US*
Texas Tech University *2025*
Fields: Organic, Chirality, Medicinal and Bioorganic Chemistry, Polymer chemistry
Dissertation: "Design, Synthesis, and Analysis of Multi-Layered 3D Fluorescent Polymers Derived from Anthracene and Naphthalene Structural Units"
Committees: Guigen Li (Chair), Huazhong Shi, and Anthony F Cozzolino

BS in Chemical Engineering *Canada*
University of New Brunswick *2019*

RESEARCH INTERESTS

- **Organic Chemistry** – Organic Synthesis, Polymer Chemistry, Polymer Materials

PUBLICATIONS

Peer-Reviewed Journal Publications

- Yuan, Q., Yan, J. X., **Liu, H.**, McDonough, P. A., Delgado, L. M., Cozzolino, A. F., ... & Li, G. Aggregation-Induced Asymmetric Synthesis (AIAS) Leading to More Selective Formation of 2, 3-Dihydrobenzofuran Based on Various Sulfur Ylides. *Synthesis*. **2025**
- Yuan, Q., Yan, J. X., **Liu, H.**, Maleka, D. M., Augusto Eichelmann, E., Villanueva, O., ... & Li, G. Aggregation-Induced Asymmetric Synthesis of 2, 3-Dihydrobenzofurans by [4+1] Annulation with Substituted Salicyl N-Phosphonyl Imines. *European Journal of Organic Chemistry* **2025**, 2500426.
- Phan, M., **Liu, H.**, Delgado, L. M., Faleke, H. O., Zhang, S., Cozzolino, A. F., ... & Li, G. The Synthesis and Property Study of NH-Ac-Anchored Multilayer 3D Polymers. *Molecules* **2025**, *30*(9), 1981.
- Xu, T., Wang, Y., Jin, S., Rahman, A. U., Yan, X., Yuan, Q., **Liu, H.**, ... & Li, G. Amino Turbo Chirality and Its Asymmetric Control. *Research* **2024**, 7, 0474.
- Wang, Y., Xu, T., Jin, S., Wang, J., Yuan, Q., **Liu, H.**, Tang, Y., Zhang, S., Yan, W., Jiao, Y., ... & Li, G. Design and Asymmetric Control of Orientational Chirality by Using the Combination of C(sp^2)–C(sp) Levers and an Achiral N-Protecting Group. *Chemistry – A European Journal* **2024**, 30(28).
- Xu, T., Wang, J.-Y., Wang, Y., Jin, S., Tang, Y., Zhang, S., Yuan, Q., **Liu, H.**, Yan, W., Jiao, Y., Yang, X.-L., ... & Li, G. C(sp)–C(sp) Lever-Based Targets of Orientational Chirality: Design and Asymmetric Synthesis. *Molecules* **2024**, 29(10), 2274.
- Chandrashekar, H. B., Dolui, P., Li, B., Mandal, A., **Liu, H**., Guin, S., & Maiti, D。Ligand-Enabled δ-C (sp^3)− H Borylation of Aliphatic Amines. *Angewandte Chemie International Edition* ***2021***, *60*(33), 18194-18200.

- Yang, K., Song, M., **Liu, H.**, & Ge, H. Palladium-catalyzed direct asymmetric C–H bond functionalization enabled by the directing group strategy. *Chemical Science* **2020**, *11*(47), 12616-12632.

Under Review

- **Liu, H.**, Akinpelu, Z. M., Phan, M., Yuan, Q., Li, B., Delgado Cordoba, L., Nawaz, H., Cozzolino, A. F., Pappas, D., & Li, G. Design, Synthesis, and Analysis of Multilayered 3D Fluorescent Polymers Derived from Anthracene and Naphthalene Structural Units.
- **Liu, H**., Delgado Cordoba, L., Phan, M., Akinpelu, Z. M., Yuan, Q., Meyer, D., Cozzolino, A. F., Pappas, D., & Li, G. Multilayered 3D Ferrocene–Naphthalene Conjugated Polymers: Design, Aggregation-Controlled Photophysics, and Redox Activity.

Patents

- Yan, S., Wu, F., **Liu, H.**, Shen, Y., Zhang, Y., Liu, J., Shen, J., Gu, S., Ma, X., Chen, D., Zhang, Y., & Wei, J. (2018). A method for phase transfer catalysis Synthesis of di-tert-butyl ester using. (Patent No. CN108794335A).
- Ding, X., Zhang, Y., Xue, P., Liu, J., Shen, J., Gu, S., Ma, X., Chen, D., **Liu, H.**, & Shen, Y. (2018). A synthetic 1- (3-ethoxy-4-methoxy) phenyl-2-methanesulfonyl-ethylamine method. (Patent No. CN108752248A).
- Zhang, Y., Cheng, H., Yan, S., Liu, J., Shen, J., Gu, S., Ma, X., Chen, D., Zhang, Y., Wei, J., **Liu, H.**, & Shen, Y. (2017). Method for continuously preparing m-toluic acid by adopting tubular reactor. (Patent No. CN107903165A).
- Yan, S., Cheng, H., Zhang, Y., Liu, J., Shen, J., Gu, S., Ma, X., Chen, D., Zhang, Y., Wei, J., **Liu, H.**, & Shen, Y. (2017). Method for continuously synthesizing N, N-diethyl-m-methyl benzamide. (Patent No. CN107840805A).

TEACHING EXPERIENCE

Instructor, Department of Chemistry & Biochemistry, Texas Tech University

- CHEM 1105: Experimental Chemical Basics — *Fall* 2019
- CHEM 3105: Experimental Organic Chemistry I — 2020
- CHEM 3106: Experimental Organic Chemistry II — 2021-2025

RESEARCH EXPERIENCE

Research Assistant, Texas Tech University — *US*
Supervisor: Prof. Guigen Li — *2019-2025*

- Project: Multi-Layer 3D Chirality
- Focused on novel chiral frameworks, characterized by unique C2 and pseudo C2 symmetry, achieved through enantioselective synthesis and aggregation-induced emission.

Research Assistant, Changzhou University — *China*
Supervisor: Prof. Yue Zhang — *2017-2018*

- Project 1: Method for continuously synthesizing N, N-diethyl-m-methyl benzamide
- Project 2: Method for synthesizing 1-(3-ethoxy-4-methoxy) phenyl-2-methanesulfonyl ethylamine.
- Project 3: A method for phase transfer catalysis Synthesis of di-tert-butyl ester using
- Project 4: Method for continuously preparing m-toluic acid by adopting tubular reactor
- Contributed to the group by successfully completing four industrial patents.

Project Team Member, University of New Brunswick *Canada*
Supervisor: Prof. Kripa Singh *2017-2018*

- Project: Sludge Dewatering System
- Contributed to the design of a sludge dewatering system for a paper-making company, including material selection, device design, and simulated sludge testing.

PROFESSIONAL TRAINING

- Operation and Data Analysis of Nuclear Magnetic Resonance (NMR) Spectrometers
- Operation and Maintenance of Gas Chromatography–Mass Spectrometry (GC–MS)
- Application and Method Development for Liquid Chromatography–Mass Spectrometry (LC–MS)
- Routine Operation and Method Optimization of High-Performance Liquid Chromatography (HPLC)
- Gel Permeation Chromatography (GPC) for Molecular-Weight Distribution Analysis
- Use and Data Interpretation of Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS)

SKILLS

Languages	Chinese (Native), English (Fluent)
Software	Chemdraw, MestReNova, Origin, Aspen, Solidwork, LaTex
Lab Instrumentation	**N**uclear Magnetic Resonance (NMR) spectrometers, Gel Permeation Chromatography (GPC) systems, High-Performance Liquid Chromatography (HPLC), Polarimeter, Liquid Chromatography–Mass Spectrometry (LC–MS), Gas Chromatography–Mass Spectrometry (GC–MS), Circular Dichroism (CD) spectrometer, Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS), Fluorescence spectrophotometer, Ultraviolet–Visible (UV–Vis) spectrophotometer

PROFESSIONAL REFERENCE

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