

# LEI LIU

Email: [liulei@umd.edu](mailto:liulei@umd.edu) Phone: 301-648-1081  
3354 Chemistry Building, 8051 Regents Dr., College Park, MD 20742-4454

## Education and Research

**Since Mar. 2017: PostDoc**, Organic Chemistry, Department of Chemistry & Biochemistry, University of Maryland, College Park, MD, U.S. (Supervisors: Dr. Osvaldo Gutierrez)

- Mechanistic Probes for Bisphosphine Iron-Catalyzed Cross-Coupling Reactions

**Aug. 2015-Mar. 2017: Research Associate**, Department of Synthetic Medicinal Chemistry, Institute of Materia Medica, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing, China (Supervisors: Dr. Xiandao Pan)

- Dearomatization Strategies in the Synthesis of the Natural Product Evodiamine Derivatives: Discovery of Highly Potent and Multitargeting Antitumor Agents.

**Oct. 2013-Dec. 2015: Visiting Scholar**, Organic Chemistry, Department of Chemistry, University of Pennsylvania, Philadelphia, PA, U.S. (Supervisor: Dr. Marisa C. Kozlowski)

- Vanadium-Catalyzed Regioselective Oxidative Coupling of 2-Hydroxycarbazoles.
- Experience in High-Throughput Experimentation (HTE) in a Collaborative Research Program with *Merck & Co, Inc. Catalysis Center*

**Sep. 2009-Jul. 2015: Ph.D.**, Pesticide Science (Organic Synthesis), College of Science, China Agricultural University (CAU), Beijing, China (Supervisors: Dr. Bin Fu)

- Synthesis of Heteroarylidene-Tethered Phosphine-Oxazoline Ligands
- Synthesis of Heteroarylidene-Tethered Bis(oxazoline) and Their Application in the Catalyzed Friedel-Crafts, Allylic Alkylation and Nitroaldol (Henry) Reaction.
- Synthesis of Heteroarylidene-Tethered Bis(thiazoline) and Their Application in the Catalyzed Friedel-Crafts Reaction.

**Sep. 2005-Jul. 2009: B.S.**, Chemistry, College of Science, CAU, Beijing, China (Supervisors: Dr. Bin Fu)

- Synthesis and biological activity of 2-indolyl oxazoline and thiazoline derivatives

## Publications and Patent

1. **Liu, L.**; Lee, W.; Zhou, J. Bandyopadhyay, S.; Gutierrez, O. "Radical-Clock  $\alpha$ -Halo-Esters as Mechanistic Probes for Bisphosphine Iron-Catalyzed Cross-Coupling Reactions." *Tetrahedron*, 75, 129-136. (2019)
2. **Liu, L.**; Lee, W.; Yuan, M.; Gutierrez, O. "Mechanisms of Bisphosphine Iron-Catalyzed C(sp<sup>2</sup>)-C(sp<sup>3</sup>) Cross-Coupling Reactions: Inner-Sphere or Outer-Sphere Arylation?" *Comment. Inorg. Chem. Accepted*. DOI: 10.1080/02603594.2018.1539392. (Invited contribution) (2018)
3. **Liu, L.**; Carroll, P. J.; Kozlowski, M. C. "Vanadium-Catalyzed Regioselective Oxidative Coupling of 2-Hydroxycarbazoles." *Org. Lett.* 17, 508-511 (2015)

4. **Liu, L.**; Ma, H.-L.; Wu, Y.-H.; Yuan, D.-K.; Liu, J.-P.; Fu, B.; Ma, X.-D. "New Application Progress of Chiral Bis(oxazoline) Ligands in Asymmetric Catalysis." *Chin. J. Org. Chem.* **33**, 2283-2290 (2013)
5. Liu, J.-P.; Wu, Y.-H.; **Liu, L.**; Xiao, Y.-M.; Ma, X.-D.; Fu, B. "Synthesis of a New Water-Soluble Conjugated Polymers Containing Thiazoline Moiety for Antibacterial Activity Bioassay." *Adv. Mater. Res.* **690**, 1594-1598 (2013)
6. **Liu, L.**; Ma, H.-L.; Xiao, Y.-M.; Du, F.-P.; Qin, Z.-H.; Li, N.; Fu, B. "Highly Enantioselective Friedel-Crafts Alkylation of Indoles and Pyrrole with  $\beta,\gamma$ -Unsaturated  $\alpha$ -Ketoesters Catalyzed by Heteroarylidene-Tethered Bis(oxazoline) Copper Complexes." *Chem. Commun.* **48**, 9281-9283 (2012)
7. **Liu, L.**; Ma, H.-L.; Fu, B. "Allylic Alkylations Catalyzed by Palladium-Bis(oxazoline) Complexes Derived from Heteroarylidene Malonate Derivatives." *Molecules* **17**, 1992-1999 (2012)
8. Chen, H.-L.; Du, F.-P.; **Liu, L.**; Li, J.; Qin, Z.-H.; Fu, B. "Malonate-Type Bis(oxazoline) Ligands with  $sp^2$  Hybridized Bridge Carbon: Synthesis and Application in Friedel-Crafts Alkylation and Allylic Alkylation." *Tetrahedron* **67**, 9602-9608 (2011)
9. **Liu, L.**; Zhao, Q.-Y.; Du, F.-P.; Chen, H.-L.; Qin, Z.-H.; Fu, B. "Highly Enantioselective Friedel-Crafts Reaction of Indoles with N-Sulfonyl Aldimines Catalyzed by Heteroarylidene Malonate-Type Bis(oxazoline) Copper(II) Complexes." *Tetrahedron:Asymmetry* **22**, 1874-1878 (2011)
10. **Liu, L.**; Yuan, H.-Z.; Qin, Z.-H.; Yan, X.-J.; Xiao, Y.-M.; Li, N.; Fu, B. "Synthesis and Fungicidal Activity of Thiazoline Derivatives Containing Halogenated Indolyl Moiety." *Phos. Sulf. Silicon and Relat.* **186**, 1790-1800 (2011)
11. **Liu, L.**; Li, J.; Wang, M.-A.; Du, F.-P.; Qin, Z.-H.; Fu, B. "Synthesis of Heteroarylidene Malonate Derived Bis(thiazoline) and Their Application in the Catalyzed Friedel-Crafts Reaction." *Tetrahedron:Asymmetry* **22**, 550-557 (2011)
12. Li, J.; Chen, H.-L.; **Liu, L.**; Fu, B. "Synthesis of New C2-Symmetric Fluoren-9-ylidene Malonate Derived Bis(oxazoline) Ligands and Their Application in Friedel-Crafts Reactions." *Molecules* **15**, 8582-8590 (2010)
13. Sun, Y.-J.; Li, N.; Zheng, Z.-B.; **Liu, L.**; Yu, Y.-B.; Qin, Z.-H.; Fu, B. "Highly Enantioselective Friedel-Crafts Reaction of Indole with Alkylidenemalonates Catalyzed by Heteroarylidene Malonate-Derived Bis(oxazoline) Copper(II) Complexes." *Adv. Synth. Catal.* **351**, 3113-3117 (2009)
14. **Liu, L.**; Zheng, Z.-B.; Qin, Z.-H.; Fu, B. Yuan, H.-Z. "Synthesis and Biological Activity of 2-Indolyl Oxazoline and Thiazoline Derivatives." *Chin. J. Org. Chem.* **28**, 1841-1845 (2008).
15. Fu, B.; **Liu, L.**; Li, J.; Yu, Y.-B.; Zhao, Q.-Y. "Preparation of Thiazole Derivatives as Germicide." Chinese Patent (2010), 201010250887.1
16. Fu, B.; Sun, Y.-J.; **Liu, L.**; Yu, Y.-B.; Zheng, Z.-B. "Preparation and Application of Aromatic

Heterocyclic Ring Methylene Bisoxazoline Compounds." Chinese Patent (2009), ZL200910087763.3

## Honors and Awards

- Excellent Doctoral Graduate, CAU (given to top 3%) 2015
- National government study abroad scholarship, China (given to top 3%) 2013
- National Scholarship granted by Ministry of Education, China (given to top 3%) 2012
- Scholarship Award for Excellent Doctoral Student granted by Ministry of Education, China (given to top 3%) 2012
- Nomination Prize of the Youth Pacemaker, CAU 2011
- Scientific Research Achievement Scholarship and Excellent Student Cadre, CAU 2010
- Excellent Undergraduate, CAU (given to top 3%) 2009
- Excellent Volunteer of Beijing Olympic Games, CAU 2008
- The First Prize Scholarship for social activities, CAU 2008
- The First Prize Scholarship for Scientific and Technological Innovation, CAU 2008
- Excellent Student Cadre, CAU 2008
- Excellent Volunteer of 'Good-Luck Beijing' Sport Events, CAU 2007
- The Second Prize scholarship for social activities, CAU 2006

## Skills

- Strong background in **Organic Synthesis and Asymmetric Catalysis**.
- Proficient in **Schlenk line, Glove box, NMR (1D and 2D), FTIR, UV, MS, HPLC, GC-MS**.
- Proficient in **High-Throughput Experimentation (HTE)**.
- Proficient in Chinese and English.

## Social activities

- Committee member of Youth League, CAU 09/2011-10/2013
- Chairman of Graduate Student Union, College of Science, CAU 04/2010-04/2011
- Volunteer of Beijing Olympic Games 08/2008
- Chairman of Undergraduate Student Union, College of Science, CAU 04/2007-04/2008
- Monitor of National Flag Guard, CAU 09/2006-08/2007
- Monitor of Class 054, Department of Chemistry, College of Science, CAU 09/2005-09/2007

## References

Dr. Bin Fu  
China Agricultural University  
fubinchem@cau.edu.cn

Dr. Marisa C. Kozlowski  
University of Pennsylvania  
marisa@sas.upenn.edu

Dr. Osvaldo Gutierrez  
University of Maryland, College Park  
ogs@umd.edu