

Hao Xu, Ph.D.

Curriculum Vitae

Georgia State University
Department of Chemistry
Petit Science Center 319
100 Piedmont Ave. SE
Atlanta, GA 30303

Tel: (404) 413-5553

Fax: (404) 413-5505
<http://sites.gsu.edu/hxu>
hxu@gsu.edu

Employment

Georgia State University

Department of Chemistry, College of Arts and Sciences, Atlanta, GA (August 2010–Present)

Assistant Professor of Chemistry

Research Interests

Synthetic and mechanistic organic chemistry for applications in biomedical science. Discovery of new catalytic reactions directed towards synthetic chemistry.

Current Research Topics

Discovery of iron-catalyzed nitrogen atom transfer reactions for stereoselective olefin difunctionalization.

Education

Harvard University

Camille and Henry Dreyfus Postdoctoral Fellow with Professor Eric Jacobsen

Department of Chemistry and Chemical Biology, Cambridge, MA (August 2006–July 2010)

Research Topic: Green catalytic methods for complex-molecule synthesis.

The Scripps Research Institute

Ph.D. Studies in Synthetic Organic Chemistry with Professor K. C. Nicolaou

Department of Chemistry, La Jolla, CA (July 2001–July 2006)

Dissertation: The total synthesis of complex anticancer natural products: 1-O-methylateriflorone, gambogin and floresolide.

Peking University B.S. in Chemistry

Department of Chemistry, Beijing, People's Republic of China (September 1997–July 2001)

Awards and Honors

- Alfred P. Sloan Research Fellowship 2015
- Dean's Early Career Award (Georgia State University) 2015
- National Science Foundation CAREER Award (declined due to funding overlap) 2014
- Thieme Chemistry Journal Award 2014
- Camille and Henry Dreyfus Postdoctoral Fellowship 2006–2009
- Bristol-Myers Squibb Graduate Fellowship in Synthetic Organic Chemistry 2005–2006
- Lesly Starr Shelton Award for Excellence in Chemistry Graduate Studies 2005

- Skaggs Research Predoctoral Fellowship 2003–2006
- Wu–Si Award for Outstanding Junior Students in Peking University 1999–2000
- Peking University President Award for Outstanding Freshmen 1998–1999
- Finalist and Silver Medal in the National Chemistry Olympiad, China 1997
- Finalist and Bronze Medal in the National Physics Olympiad, China 1996

Current Research Support

NIH R01 GM 110382 Xu (PI) 05/01/2014–02/28/2019

National Institute of General Medical Sciences
 Selective Nitrogen Atom Transfer for Applications in Biomedical Sciences: \$ 1,405,000

Sloan Research Fellowship Xu (PI) 09/15/2015–9/14/2017

Alfred P. Sloan Foundation: \$ 50,000

NSF CAREER SusChEM 1352319 Xu (PI) 06/01/2014–05/31/2019

National Science Foundation, Division of Chemistry
 Non-activated due to Funding Overlap

Complete Research Support

PRF #51571-DNI 1 Xu (PI) 09/01/2011–08/31/2014

American Chemical Society Petroleum Research Fund
 Catalytic Enantioselective Phenolic Oxidation by Cooperative Catalysis: \$ 100,000

Publications from Independent Research

19. Zhu, C.-L.; Tian, J.-S.; Gu, Z.-Y.; Xing, G.-W.; Xu, H.* “Iron(II)-Catalyzed Asymmetric Intramolecular Olefin Aminochlorination with Chloride Ion” *Chem. Sci.* **2015**, *6*, DOI: 10.1039/C5SC00221D
18. Lu, D. F.; Zhu, C. L.; Jia, Z. X.; Xu, H.* “Iron(II)-Catalyzed Intermolecular Amino-Oxygenation of Olefins through the N–O Bond Cleavage of Functionalized Hydroxylamines” *J. Am. Chem. Soc.* **2014**, *136*, 13186.
[Highlighted in:](#) * *Synfacts* **2014**, *10*, 1278.
17. Lu, D. F.; Liu, G. S.; Zhu, C. L.; Yuan, B.; Xu, H.* “Iron(II)-Catalyzed Intramolecular Olefin Aminofluorination.” *Org. Lett.* **2014**, *16*, 2912.
[Highlighted in:](#) * *Synfacts* **2014**, *10*, 844.
16. Zhu, C. L.; Zhang, Y. Q.; Yuan, Y. A.; Xu, H.* “Copper-Catalyzed Aerobic C–H Trifluoromethylation of Phenanthrolines.” *Synlett.* **2014**, *25*, DOI: 10.1055/s-0034-1379319 (*Invited Cluster Report–Catalysis with Sustainable Metals*).
[Highlighted in:](#) * *Synlett* **2015**, *26*, 306 by Matthew Gaunt, Hak-Fun Chow, and Tomislav Rovis.

15. Liu, G. S.; Zhang, Y. Q.; Yuan, Y. A.; Xu, H.* "Iron(II)-Catalyzed Intramolecular Aminohydroxylation of Olefin with Functionalized Hydroxylamines." *J. Am. Chem. Soc.* **2013**, *135*, 3343.
Highlighted by: * [Synfact review invitation by K. Peter C. Vollhardt.](#)
14. Lu, D. F.; Zhu, C. L.; Xu, H.* "Copper(I)-Catalyzed Diastereoselective Hydroxytrifluoromethylation of Dienes Accelerated by Phosphine Ligands" *Chem. Sci.* **2013**, *4*, 2478.
Highlighted in: * [Synfacts 2013, 9, 1295.](#)
13. Zhang, Y. Q.; Yuan, Y. A.; Liu, G. S.; Xu, H.* "Iron(II)-Catalyzed Asymmetric Intramolecular Aminohydroxylation of Indoles." *Org. Lett.* **2013**, *15*, 3910.
Highlighted in: * [Synfacts 2013, 9, 1204.](#)
12. Zhang, Y. Q.; Liu, J. D.; Xu, H.* "Copper(II)-Catalyzed Trifluoromethylation of *N*-Aryl Imines." *Org. Biomol. Chem.* **2013**, *11*, 6242.
11. Liu, G. S.; Wilkerson, P. D.; Toth, C. A.; Xu, H.* "Highly Enantioselective Cyclizations of Conjugated Trienes with Low Catalyst Loadings: A Robust Chiral NHC Enabled by Acetic Acid Cocatalyst." *Org. Lett.* **2012**, *14*, 858.

Publications during Postdoctoral, Ph.D. and Undergraduate Research

10. Xu, H.; Zuend, S. J.; Woll, M. G.; Tao, Y.; Jacobsen, E. N. "Asymmetric Cooperative Catalysis of Strong Brønsted Acid-Promoted Reactions using Chiral Ureas." *Science* **2010**, *327*, 986.
9. Xu, H.; Zhang, H.; Jacobsen, E. N. "Enantioselective Catalytic Povarov Reactions to Access Stereochemically Rich Tetrahydroquinolines. Asymmetric Catalysis of Strong Brønsted Acid-Promoted Reactions Using Chiral Ureas." *Nat. Protoc.* **2014**, *9*, 1860.
8. Gerard, B.; O'Shea, M. W.; Donckele, E.; Kesavan, S.; Akella, L. B.; Xu, H.; Jacobsen, E. N.; Marcaurelle, L. A. "Application of a Catalytic Asymmetric Povarov Reaction using Chiral Ureas to the Synthesis of a Tetrahydroquinoline Library." *ACS Comb. Sci.* **2012**, *14*, 621.
7. Hayden, A. E.; Xu, H.; Nicolaou, K. C.; Houk, K. N. "Origins of Selectivity in Pericyclic Reaction Cascades for the Synthesis of Gambogin and Lateriflorone." *Org. Lett.* **2006**, *8*, 2989.
6. Nicolaou, K. C.; Xu, H. "Total Synthesis of Floresolide B and $\Delta^{6,7}$ -Z-floresolide B." *Chem. Comm.* **2006**, 600.
5. Nicolaou, K. C.; Xu, H.; Wartmann, M. "Biomimetic Total Synthesis of Gambogin and Rate Acceleration of Pericyclic Reactions in Aqueous Media." *Angew. Chem. Int. Ed.* **2005**, *44*, 756.
4. Nicolaou, K. C.; Sasmal, P. K.; Xu, H. "Biomimetically Inspired Total Synthesis and Structure Activity Relationships of 1-*O*-Methylateriflorone. 6π Electrocyclizations in Organic Synthesis." *J. Am. Chem. Soc.* **2004**, *126*, 5493.
3. Nicolaou, K. C.; Sasmal, P. K.; Xu, H.; Namoto, K.; Ritzén, A. "Total Synthesis of 1-*O*-Methylateriflorone." *Angew. Chem. Int. Ed.* **2003**, *42*, 4225.
2. Yao, W.; Liao, M.; Zhang, X.; Xu, H.; Wang, J. "The Study of $\text{Rh}_2(\text{OAc})_4$ or $\text{BF}_3\cdot\text{OEt}_2$ -Mediated Reaction of Thiolacetic Acid with α -Diazocarbonyl Compounds." *Eur. J. Org. Chem.* **2003**, 1784.

1. Liu, X.; Xu, H.; Fang, Y.; Cui, Y.; Xu, P. "NMR Study of 6-Aryl-3-cinchopheny-1,2,4-triazolo[3,4-b]1,3,4-thiadiazoles." *Magn. Reson. Chem.* 2001, 39, 411.

Named Lectureships

Princeton University, Bristol-Myers Squibb Lecture in Organic Synthesis, Department of Chemistry, March 12, 2015.

Nagoya University, Department of Applied Chemistry, "Green Material Conversion Lecture", Nagoya, Japan, July 31, 2013.

Invited Seminars

PacificChem 2015, "Cognizance of Endangered Elements for Organic Synthesis" and "Chemical Glycosylation" December 15, 2015.

The Scripps Research Institute, Department of Chemistry, May 1, 2015.

University of California, Irvine, Department of Chemistry, April 29, 2015.

University of California, Santa Barbara, Department of Chemistry and Biochemistry, April 27, 2015.

University of California, Los Angeles, Department of Chemistry and Biochemistry, April 23, 2015.

University of Southern California, Department of Chemistry, April 22, 2015.

Bristol-Myers Squibb, New Brunswick, April 8, 2015.

University of Pennsylvania, Department of Chemistry, April 6, 2015.

University of Michigan, Department of Chemistry, March 19, 2015.

University of Delaware, Department of Chemistry and Biochemistry, March 10, 2015.

University of Texas, Austin, Department of Chemistry, December 12, 2014.

Amgen Cambridge, December 9, 2014.

Brandeis University, Department of Chemistry, December 8, 2014.

Boston College, Department of Chemistry, December 4, 2014.

Texas A&M University, Department of Chemistry, November 20, 2014.

UT Southwestern Medical Center at Dallas, Department of Biochemistry, November 18, 2014.

The University at Buffalo, Department of Chemistry, November 10, 2014.

North Carolina State University, Department of Chemistry, November 5, 2014.

Duke University, Department of Chemistry, November 4, 2014.

University of Pittsburgh, Department of Chemistry, October 30, 2014.

Purdue University, Department of Chemistry, October 21, 2014.

The Ohio State University, Department of Chemistry and Biochemistry, October 7, 2014.

Wayne State University, Department of Chemistry, September 23, 2014.

Michigan State University, Department of Chemistry, September 22, 2014.

Toledo University, Department of Chemistry, September 21, 2014.

Washington University in St. Louis, Department of Chemistry, September 18, 2014.

West Virginia University, Department of Chemistry, September 3, 2014.

Shanghai Institute of Organic Chemistry, August 16, 2013.

Talks and Posters at Conferences and Meetings

250th American Chemical Society National Meeting, Young Academic Investigator's Symposium, August 16–20, 2015.

Stereochemistry Gordon Research Conference, July 27–August 1, 2014.

Organic Reactions and Processes Gordon Research Conference, July 14–19, 2013.

Organic Reactions and Processes Gordon Research Conference, July 24–29, 2011.

Natural Product Gordon Research Conference, July 2009.

Organic Reactions and Processes Gordon Research Conference, July 2009.

Stereochemistry Gordon Research Conference, July 2008.

Organic Reactions and Processes Gordon Research Conference, July 2007.

Teaching and Mentoring Experience

Teaching at Georgia State University

Spring 2015: CHEM 4430/6430-Advanced Synthetic Organic Chemistry.

Fall 2014: CHEM 4490/6490-Organic Structure Determination.

CHEM 6890-Responsible Conduct of Research.

Spring 2014: CHEM 4430/6430-Advanced Synthetic Organic Chemistry.

Fall 2013: CHEM 4490/6490-Organic Structure Determination.

Spring 2013: CHEM 3110-Sophomore Organic Chemistry Laboratory.

Fall 2012: CHEM 4490/6490-Organic Structure Determination.

Spring 2012: CHEM 4430/6430-Advanced Synthetic Organic Chemistry.

Fall 2011: CHEM 4400/6400-Physical Organic Chemistry.

CHEM 6890-Responsible Conduct of Research.

Spring 2011: CHEM 2400-Sophomore Organic Chemistry.

Fall 2010: CHEM 6890-Responsible Conduct of Research.

Mentoring at Georgia State University

Postdoctoral Associates Mentored

Dr. Deng-Fu Lu 8/2012–Present

Dr. Jun-Shan Tian 5/2014–Present

Dr. Guansai Liu 11/2010–9/2013

Dr. Yongqiang Zhang 1/2012–12/2013

Dr. Yun-Rong Chen 4/2014–3/2015

Dr. Thimurtulu Neetipalli 11/2014–3/2015

Ph.D. Students Mentored

Allen Y. Yuan 1/2012–Present

Cheng-Liang Zhu 8/2012–Present

M.S. Students Mentored (through a Separated M.S. Program)

Jeffrey Sears 1/2014–Present

Garrett Edmunds 8/2014–Present

Christopher Toth 8/2010–5/2012 (Graduated)

Phillip Wilkerson 8/2010–5/2012 (Graduated)

Visiting Ph.D. Students Mentored

Dr. Zhen-Xin Jia 2/2013–2/2014 (Graduated)

Dr. Qing-Jiang Li	2/2013–6/2013 (Graduated)
Ji-Dan Liu	8/2012–4/2013
Dr. Zhen-Yuan Gu	10/2013–10/2014 (Graduated)

Undergraduate Students Mentored

Eseosaserea Igbinijie
Trevon Norman
Patrick Major
Hong Nguyen
Joseph Rothensal

SEED Students Mentored

Cameron Jones
William Hardy

Mentoring through Dissertation and Qualified Exam Committees at Georgia State University

Mohui Wei
Theresa Gaines
Eric Owens
Xifang Liu
Fan Pu
Liuqing Wen
Hamed Reyhanfard
Juan Zou
Hengfu Wu
Ziyuan Fang
Shirish Paranjpe
Zhigang Wu

Departmental Service

Fund-raiser and Organizer for Three Annual Endowed Distinguished Lectureships at Georgia State University Sigma–Aldrich, Agilent, and Biotage Lectureships	2012–Present
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Chemistry Student Award Petition Committee (Georgia State University)	2010–Present
NMR Director Search Committee	2011

Journal Article Review

J. Am. Chem. Soc.; *Chem. Sci.*; *Org. Lett.*; *J. Org. Chem.*; *Chem. Commun.*; *Organometallics*; *Org. Biomol. Chem.*; *Tetrahedron*; *Tetrahedron Lett.*; *Synlett*; *Synthesis*; *Beilstein J. Org. Chem.*

Grant Review

NIH Synthetic and Biological Chemistry Study Section A (SBCA) Ad hoc member	2014
Hong Kong Science Research Grants Council	2011–Present