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A. EDUCATION AND TRAINING

- 1999-2001 Postdoc; Massachusetts Institute of Technology (Advisor: Stephen L. Buchwald)
- 1996-1999 Postdoc; Massachusetts Institute of Technology (Advisor: Stephen J. Lippard)
- 1991-1996 Ph.D.; University of Pennsylvania (Advisor: Bradford B. Wayland)
- 1985-1988 M.S.; Beijing Normal University, China (Advisor: Bo-Li Liu)
- 1981-1985 B.S.; Anhui Normal University, China (Advisor: Huai-Zhu Ma)

B. POSITIONS AND HONORS

Positions and Employments

- 2015-Now Full Professor, Department of Chemistry, Boston College
- 2010-2015 Full Professor, Department of Chemistry, University of South Florida
- 2006-2010 Associate Professor, Department of Chemistry, University of South Florida
- 2001-2006 Assistant Professor, Department of Chemistry, University of Tennessee
- 1999-2001 Postdoctoral Associate, Department of Chemistry, MIT
- 1996-1999 NIH Postdoctoral Fellow, Department of Chemistry, MIT

Other Experience and Professional Memberships

- 2016-2019 Scientific Consultant, Zafgen, Inc.
- 2016-2019 Scientific Consultant, bioAffinity Technologies, Inc.
- 2016 Ad Hoc Member, SBCA Study Section, National Institutes of Health
- 2015 Ad Hoc Member, SBCA Study Section, National Institutes of Health
- 2011-2012 Key Laboratory Senior Visiting Scholarship, Fudan University
- 2010 Charter Member of National Academy of Inventors
- 2002-2003 Member, Catalysis Center Planning Committee, Oak Ridge National Laboratory

Honors and Awards

- 2009 Thieme Chemistry Journal Award
- 2008 University Research Merit Award, University of South Florida
- 2007 Outstanding Research Achievement Award, University of South Florida
- 2006 NSF CAREER Award
- 2005 Chancellor's Professional Development Award, University of Tennessee
- 2003 ORAU Ralph Powe Junior Faculty Award
- 1996 NIH Postdoctoral Fellow

C. RESEARCH INTERESTS

- Development of One-Electron Catalytic Approaches for Homolytic Radical Chemistry
- Conceptualization, Formulation and Establishment of Metalloradical Catalysis (MRC)
- Design and Synthesis of Metalloradical-Based Catalysts for Metalloradical Catalysis
- Application of Metalloradical Catalysis for Stereoselective Radical Cyclization Reactions
- Application of Metalloradical Catalysis for Stereoselective Radical C–H Functionalization
- Application of Metalloradical Catalysis for Stereoselective Radical Cascade Processes
- Application of Metalloradical Catalysis for Radical Construction of Complex Molecules

D. SELECTED RECENT PUBLICATIONS

- Xu, P.; Xie, J.-J.; Wang, D.-S.; Zhang, X. P. “Metalloradical Approach for Concurrent Control of Multiple Convergences and Selectivities in Intermolecular Radical Allylic C–H Amination” *Nat. Chem.* **2022**, Accepted for Publication. [[Link](#)]
- Lang, K.; Yang, H.; Lee, W.-C. C.; Zhang, X. P. “Combined Radical and Ionic Approach for The Enantioselective Synthesis of β -Functionalized Amines from Alcohols” *Nat. Synth.* **2022**, *1*, 548–557. [[Link](#)][[Text](#)][[Highlight](#)]
- Ke, J.; Lee, W.-C. C.; Wang, X.-X.; Wang, Y.; Wen, X.; Zhang, X. P. “Metalloradical Activation of In Situ-Generated α -Alkynyldiazomethanes for Asymmetric Radical Cyclopropanation of Alkenes” *J. Am. Chem. Soc.* **2022**, *144*, 2368–2378. [[Link](#)]
- Wang, J.-Y.; Xie, J.-J.; Lee, W.-C. C.; Wang, D.-S.; Zhang, X. P. “Radical Differentiation of Two Ester Groups in Unsymmetrical Diazomalonates for Highly Asymmetric Olefin Cyclopropanation” *Chem Catal.* **2022**, *2*, 330–344. [[Link](#)][[Highlight](#)][[SynForm](#)]
- Xie, J.-J.; Xu, P.; Zhu, Y.-L.; Wang, J.-Y.; Lee, W.-C. C.; Zhang, X. P. “New Catalytic Radical Process Involving 1,4-Hydrogen Atom Abstraction: Asymmetric Construction of Cyclobutanones” *J. Am. Chem. Soc.* **2021**, *143*, 111670–111678. [[Link](#)]
- Wang, X.-X.; Ke, J.; Zhu, Y.-L.; Deb, A.; Xu, Y.-J.; Zhang, X. P. “Asymmetric Radical Process for General Synthesis of Chiral Heteroaryl Cyclopropanes” *J. Am. Chem. Soc.* **2021**, *143*, 11121–11129. [[Link](#)]
- Zhang, C.-Z.; Wang, D.-S.; Lee, W.-C. C.; McKillop, A. M.; Zhang, X. P. “Controlling Enantioselectivity and Diastereoselectivity in Radical Cascade Cyclization for Construction of Bicyclic Structures” *J. Am. Chem. Soc.* **2021**, *143*, 11130–11140. [[Link](#)]
- Lee, W.-C. C.; Wang, D.-S.; Zhang, C.-Z.; Xie, J.-J.; Li, B.; Zhang, X. P. “Asymmetric Radical Cyclopropanation of Dehydroaminocarboxylates: Stereoselective Synthesis of Cyclopropyl α -Amino Acids” *Chem* **2021**, *7*, 1588–1601. [[Link](#)]
- Riart-Ferrer, X.; Sang, P.; Tao, J.-R.; Xu, H.; Jin, L.-M.; Lu, H.-J.; Cui, X.; Wojtas, L.; Zhang, X. P. “Metalloradical Activation of Carbonyl Azides for Enantioselective Radical Aziridination” *Chem* **2021**, *7*, 1120–1134. [[Link](#)]
- Lang, K.; Li, C.-Q.; Kim, I.; Zhang, X. P. “Enantioconvergent Amination of Racemic Tertiary C–H Bonds” *J. Am. Chem. Soc.* **2020**, *142*, 20902–20911. [[Link](#)]
- Jin, L.-M.; Xu, P.; Xie, J.-J.; Zhang, X. P. “Enantioselective Intermolecular Radical C–H Amination” *J. Am. Chem. Soc.* **2020**, *142*, 20828–20836. [[Link](#)]
- Hu, Y.; Lang, K.; Li, C.-Q.; Gill, J. B.; Kim, I.; Lu, H.-J.; Fields, K. B.; Marshall, M. K.; Cheng, Q.-G.; Cui, X.; Wojtas, L.; Zhang, X. P. “Enantioselective Radical Construction of 5-

- Membered Cyclic Sulfonamides by Metalloradical C–H Amination” *J. Am. Chem. Soc.* **2019**, *141*, 18160–18169. [[Link](#)]
- Lang, K.; Torker, S.; Wojtas, L.; Zhang, X. P. “Asymmetric Induction and Enantiodivergence in Catalytic Radical C–H Amination via Enantiodifferentiative H-Atom Abstraction and Stereoretentive Radical Substitution” *J. Am. Chem. Soc.* **2019**, *141*, 12388–12396. [[Link](#)]
 - Hu, Y.; Lang, K.; Tao, J.-R.; Marshall, M. K.; Cheng, Q.-G.; Cui, X.; Wojtas, L.; Zhang, X. P. “Next-Generation D_2 -Symmetric Chiral Porphyrins for Cobalt(II)-Based Metalloradical Catalysis: Catalyst Engineering by Distal Bridging” *Angew. Chem. Int. Ed.* **2019**, *58*, 2670–2674. [[Link](#)]
 - Li, C.-Q.; Lang, K.; Lu, H.-J.; Hu, Y.; Cui, X.; Wojtas, L.; Zhang, X. P. “Catalytic Radical Process for Enantioselective Amination of $C(sp^3)$ –H Bonds” *Angew. Chem. Int. Ed.* **2018**, *57*, 16837–16841. [[Link](#)]
 - Wen, X.; Wang, Y.; Zhang, X. P. “Enantioselective Radical Process for Synthesis of Chiral Indolines by Metalloradical Alkylation of Diverse $C(sp^3)$ –H Bonds” *Chem. Sci.* **2018**, *9*, 5082–5086. [[Link](#)]
 - Wang, Y.; Wen, X.; Cui, X.; Zhang, X. P. “Enantioselective Radical Cyclization for Construction of 5-Membered Ring Structures by Metalloradical C–H Alkylation” *J. Am. Chem. Soc.* **2018**, *140*, 4792–4796. [[Link](#)]
 - Jiang, H.-L.; Lang, K.; Lu, H.-J.; Wojtas, L.; Zhang, X. P. “Asymmetric Radical Bicyclization of Allyl Azidoformates via Cobalt(II)-Based Metalloradical Catalysis” *J. Am. Chem. Soc.* **2017**, *139*, 9164–9167. [[Link](#)]
 - Xu, X.; Wang, Y.; Cui, X.; Wojtas, L.; Zhang, X. P. “Metalloradical Activation of α -Formyldiazoacetates for Catalytic Asymmetric Radical Cyclopropanation of Alkenes” *Chem. Sci.* **2017**, *8*, 4347–4351. [[Link](#)]
 - Wang, Y.; Wen, X.; Cui, X.; Wojtas, L.; Zhang, X. P. “Asymmetric Radical Cyclopropanation of Alkenes with In Situ-Generated Donor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis” *J. Am. Chem. Soc.* **2017**, *139*, 1049–1052. [[Link](#)]
 - Pegis, M. L.; McKeown, B. A.; Kumar, N.; Lang, K.; Wasylenko, D. J.; Zhang, X. P.; Raugei, S.; Mayer, J. M. “Homogenous Electrocatalytic Oxygen Reduction Rates Correlate with Reaction Overpotential in Acidic Organic Solutions” *ACS Cent. Sci.* **2016**, *2*, 850–856. [[Link](#)]
 - Jiang, H.-L.; Lang, K.; Lu, H.-J.; Wojtas, L.; Zhang, X. P. “Intramolecular Radical Aziridination of Allylic Sulfamoyl Azides via Co(II)-Based Metalloradical Catalysis: Effective Construction of Strained heterobicyclic Structures” *Angew. Chem. Int. Ed.* **2016**, *55*, 11604–11608. [[Link](#)]
 - Lu, H.-J.; Lang, K.; Jiang, H.-L.; Wojtas, L.; Zhang, X. P. “Intramolecular 1,5- $C(sp^3)$ –H Radical Amination via Co(II)-Based Metalloradical Catalysis for Five-Membered Cyclic Sulfamides” *Chem. Sci.* **2016**, DOI: 10.1039/C6SC02231F. [[Link](#)]
 - Liu, Q.-J.; Wang, L.-J.; Kang, Q.-K.; Zhang, X. P.; Tang, Y. “Cy-SaBOX/Copper(II)-Catalyzed Highly Diastereo- and Enantioselective Synthesis of Bicyclic N,O Acetals” *Angew. Chem. Int. Ed.* **2016**, *55*, 9220–9223. [[Link](#)]
 - Goswami, M.; Lyaskovskyy, V.; Domingos, S. R.; Buma, W. J.; Woutersen, S.; Troeppner, O.; Ivanovic-Burmazovic, I.; Lu, H.-J.; Cui, X.; Zhang, X. P.; Reijerse, E. J.; DeBeer S.; van

- Schooneveld, M. M.; Pfaff, F.; Ray, K.; de Bruin, B. "Characterization of Porphyrin-Co(III)-'Nitrene Radical' Species Relevant in Catalytic Nitrene Transfer Reactions" *J. Am. Chem. Soc.* **2015**, *137*, 5468–5479. [\[Link\]](#)
- Cui, X.; Xu, X.; Jin, L.-M.; Wojtas, L.; Zhang, X. P. "Stereoselective Radical C–H Alkylation with Acceptor/Acceptor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis" *Chem. Sci.* **2015**, *6*, 1219–1224. [\[Link\]](#)
 - Lu, H.-J.; Li, C.-Q.; Jiang, H.-L.; Lizardi, C. L.; Zhang, X. P. "Chemoselective Amination of Propargylic C(sp³)-H Bonds via Co(II)-Based Metalloradical Catalysis" *Angew. Chem. Int. Ed.* **2014**, *53*, 7028–7032. [\[Link\]](#)
 - Paul, N. D.; Mandal, S.; Otte, M.; Cui, X.; Zhang, X. P.; de Bruin, B. "A Metalloradical Approach to 2*H*-Chromenes" *J. Am. Chem. Soc.* **2014**, *136*, 1090–1096. [\[Link\]](#)
 - Jin, L.-M.; Lu, H.-J.; Cui, Y.; Lizardi, C. L.; Arzua, T. N.; Wojtas, L.; Cui, X.; Zhang, X. P. "Selective Radical Amination of Aldehydic C(sp²)-H Bonds with Fluoroaryl Azides via Co(II)-Based Metalloradical Catalysis: Synthesis of *N*-Fluoroaryl Amides from Aldehydes under Neutral and Nonoxidative Conditions" *Chem. Sci.* **2014**, *5*, 2422–2427. [\[Link\]](#)
 - Xu, X.; Zhu, S.-F.; Cui, X.; Wojtas, L.; Zhang, X. P. "Cobalt(II)-Catalyzed Asymmetric Olefin Cyclopropanation with α -Ketodiazoacetates" *Angew. Chem. Int. Ed.* **2013**, *52*, 11857–11861. [\[Link\]](#)
 - Jin, L.-M.; Xu, X.; Lu, H.; Cui, X.; Wojtas, L.; Zhang, X. P. "Effective Synthesis of Chiral *N*-Fluoroaryl Aziridines via Enantioselective Aziridination of Alkenes with Fluoroaryl Azides" *Angew. Chem. Int. Ed.* **2013**, *52*, 5309–5313. [\[Link\]](#)
 - Cui, X.; Xu, X.; Wojtas, L.; Kim, M. M.; Zhang, X. P. "Regioselective Synthesis of Multisubstituted Furans via Metalloradical Cyclization of Alkynes with α -Diazocarbonyls: Construction of Functionalized α -Oligofurans" *J. Am. Chem. Soc.* **2012**, *134*, 19981–19984. [\[Link\]](#)
 - Meng, L.; Cheng, Q.; Kim, C.-S.; Gao, W.-Y.; Wojtas, L.; Chen, Y.-S.; Zaworotko, M. J.; Zhang, X. P.; Ma, S.-Q. "Crystal Engineering of a Microporous, Catalytically Active *fcu* Topology MOF Using a Custom-Designed Metalloporphyrin Linker" *Angew. Chem. Int. Ed.* **2012**, *51*, 10082–10085. [\[Link\]](#)
 - Lu, H.-J.; Jiang, H.-L.; Hu, Y.; Wojtas, L.; Zhang, X. P. "Stereoselective Radical Amination of Electron-Deficient C–H Bonds by Co(II)-Based Metalloradical Catalysis: Synthesis of α -Amino Acid Derivatives via α -C–H Amination of Esters and Amides" *Org. Lett.* **2012**, *14*, 5158–5161. [\[Link\]](#)
 - Xu, X.; Lu, H.-J.; Ruppel, J. V.; Cui, X.; de Mesa, S. L.; Wojtas, L.; Zhang, X. P. "Highly Asymmetric Intramolecular Cyclopropanation of Acceptor-Substituted Diazoacetates by Co(II)-Based Metalloradical Catalysis: Iterative Approach for Development of New Generation Catalysts" *J. Am. Chem. Soc.* **2011**, *133*, 15292–15295. [\[Link\]](#)
 - Lyaskovskyy, V.; Suarez, A. I. O.; Lu, H.-J.; Jiang, H.-L.; Zhang, X. P.; de Bruin, B. "Mechanism of Cobalt(II) Porphyrin-Catalyzed C–H Amination with Organic Azides: Radical Nature and H-Atom Abstraction Ability of Cobalt(III)-Nitrene Key Intermediates" *J. Am. Chem. Soc.* **2011**, *133*, 12264–12273. [\[Link\]](#)

- Lu, H.-J.; Dzik, W. I.; Xu, X.; Wojtas, L.; de Bruin, B.; Zhang, X. P. "Experimental Evidence for Cobalt(III)-Carbene Radicals: Key Intermediates in Cobalt(II)-Based Metalloradical Cyclopropanation" *J. Am. Chem. Soc.* **2011**, *133*, 8518–8521. [\[Link\]](#)
- Cui, X.; Xu, X.; Lu, H.-J.; Zhu, S.-F.; Wojtas, L.; Zhang, X. P. "Enantioselective Cyclopropanation of Alkynes with Acceptor/Acceptor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis" *J. Am. Chem. Soc.* **2011**, *133*, 3304–3307. [\[Link\]](#)
- Wang, X.-S.; Meng, L.; Cheng, Q.-G.; Kim, C.-S.; Wojtas, L.; Chrzanowski, M.; Chen, Y.-S.; Zhang, X. P.; Ma, S.-Q. "A Three-Dimensional Porous Metal-Metalloporphyrin Framework Consisting of Nanoscopic Polyhedral Cages with a High Density of Open Metal Sites" *J. Am. Chem. Soc.* **2011**, *133*, 16322–16325. [\[Link\]](#)
- Lu, H.-J.; Jiang, H.-L.; Hu, Y.; Wojtas, L.; Zhang, X. P. "Chemoselective Intramolecular Allylic C–H Amination over C=C Aziridination through Co(II)-Based Metalloradical Catalysis" *Chem. Sci.* **2011**, *2*, 2361–2366. [\[Link\]](#)
- Lu, H.-J.; Zhang, X. P. "Catalytic C–H Functionalization by Metalloporphyrins: Recent Development and Future Directions" *Chem. Soc. Rev.* **2011**, *40*, 1899–1909. [\[Link\]](#)
- Lu, H.-J.; Jiang, H.-L.; Wojtas, L.; Zhang, X. P. "Selective Intramolecular C–H Amination via Metalloradical Activation of Azides: Synthesis of 1,3-Diamines under Neutral and Nonoxidative Conditions" *Angew. Chem. Int. Ed.* **2010**, *49*, 10192–10196. [\[Link\]](#)
- Zhu, S.-F.; Xu, X.; Perman, J. A.; Zhang, X. P. "A General and Efficient Cobalt(II)-Based Catalytic System for Highly Stereoselective Cyclopropanation of Alkenes with α -Cyano-Diazoacetates" *J. Am. Chem. Soc.* **2010**, *132*, 12796–12799. [\[Link\]](#)
- Dzik, W. I.; Xu, X.; Zhang, X. P.; Reek, J. N. H.; de Bruin, B. "Carbene Radicals' in Co^{II}(por)-Catalyzed Olefin Cyclopropanation" *J. Am. Chem. Soc.* **2010**, *132*, 10891–10902. [\[Link\]](#)
- Lu, H.-J.; Tao, J.-R.; Jones, J. E.; Wojtas, L.; Zhang, X. P. "Co(II)-Catalyzed Intramolecular C–H Amination of Phosphoryl Azides: Formation of 6- and 7-Membered Cyclophosphoramidates" *Org. Lett.* **2010**, *12*, 1248–1251. [\[Link\]](#)
- Subbarayan, V.; Ruppel, J. V.; Zhu, S.-F.; Perman, J. A.; Zhang, X. P. "Highly Asymmetric Cobalt-Catalyzed Aziridination of Alkenes with Trichloroethoxysulfonyl Azide (TcesN₃)" *Chem. Commun.* **2009**, 4266–4268. [\[Link\]](#)
- Ruppel, J. V.; Gauthier, T. J.; Snyder, N. L.; Perman, J. A.; Zhang, X. P. "Asymmetric Cobalt-Catalyzed Cyclopropanation with Succinimidyl Diazoacetate: General Synthesis of Optically Active Cyclopropyl Carboxamides" *Org. Lett.* **2009**, *11*, 2273–2276. [\[Link\]](#)
- Zhu, S.-F.; Perman, J. A.; Zhang, X. P. "Acceptor/Acceptor-Substituted Diazo Reagents for Carbene Transfers: Cobalt-Catalyzed Asymmetric (*Z*)-Cyclopropanation of Alkenes with α -Nitro-Diazoacetates" *Angew. Chem. Int. Ed.* **2008**, *47*, 8460–8463. [\[Link\]](#)
- Zhu, S.; Ruppel, J. V.; Lu, H.; Wojtas, L.; Zhang, X. P. "Cobalt-Catalyzed Asymmetric Cyclopropanation with Diazosulfones: Rigidification and Polarization of Ligand Chiral Environment via Hydrogen Bonding and Cyclization" *J. Am. Chem. Soc.* **2008**, *130*, 5042–5043. [\[Link\]](#)
- Ruppel, J. V.; Jones, J. E.; Huff, C. A.; Kamble, R. M.; Chen, Y.; Zhang, X. P. "A Highly Effective Cobalt Catalyst for Olefin Aziridination with Azides: Hydrogen Bonding-Guided Catalyst Design" *Org. Lett.* **2008**, *10*, 1995–1998. [\[Link\]](#)

- Chen, Y.; Ruppel, J. V.; Zhang, X. P. "Cobalt-Catalyzed Asymmetric Cyclopropanation of Electron-Deficient Olefins" *J. Am. Chem. Soc.* **2007**, *129*, 12074–12075. [\[Link\]](#)
- Baskaran, D.; Mays, J. W.; Zhang, X. P.; Bratcher, M. S. "Carbon Nanotubes with Covalently Linked Porphyrin Antennae: Photoinduced Electron Transfer" *J. Am. Chem. Soc.* **2005**, *127*, 6916–6917. [\[Link\]](#)
- Chen, Y.; Fields, K. B.; Zhang, X. P. "Bromoporphyrins as Versatile Synthons for Modular Construction of Chiral Porphyrins: Cobalt-Catalyzed Highly Enantioselective and Diastereoselective Cyclopropanation" *J. Am. Chem. Soc.* **2004**, *126*, 14718–14719. [\[Link\]](#)

E. FULL LIST OF RESEARCH PUBLICATIONS

1. Xu, P.; Xie, J.-J.; Wang, D.-S.; Zhang, X. P. "Metalloradical Approach for Concurrent Control of Multiple Convergences and Selectivities in Intermolecular Radical Allylic C–H Amination" *Nat. Chem.* **2022**, Accepted for Publication. [\[Link\]](#)
2. Lang, K.; Yang, H.; Lee, W.-C. C.; Zhang, X. P. "Combined Radical and Ionic Approach for The Enantioselective Synthesis of β -Functionalized Amines from Alcohols" *Nat. Synth.* **2022**, *1*, 548–557. [\[Link\]](#)[\[Text\]](#)[\[Highlight\]](#)
3. Lee, W.-C. C.; Zhang, X. P. "Asymmetric Radical Cyclopropanation of Alkenes" *Trends Chem.* **2022**, *4*, 850–851. [\[Link\]](#)
4. Ke, J.; Lee, W.-C. C.; Wang, X.-X.; Wang, Y.; Wen, X.; Zhang, X. P. "Metalloradical Activation of In Situ-Generated α -Alkynyldiazomethanes for Asymmetric Radical Cyclopropanation of Alkenes" *J. Am. Chem. Soc.* **2022**, *144*, 2368–2378. [\[Link\]](#)
5. Wang, X.-X.; Zhang, X. P. "Catalytic Radical Approach for Selective Carbene Transfers via Cobalt(II)-Based Metalloradical Catalysis" In *Transition Metal-Catalyzed Carbene Transformations*; eds. Wang, J.-B.; Che, C.-M.; Doyle, M. P. John Wiley & Sons, **2022**, Chapter 2, 25–66. [\[Link\]](#)
6. Wang, J.-Y.; Xie, J.-J.; Lee, W.-C. C.; Wang, D.-S.; Zhang, X. P. "Radical Differentiation of Two Ester Groups in Unsymmetrical Diazomalonates for Highly Asymmetric Olefin Cyclopropanation" *Chem Catal.* **2022**, *2*, 330–344. [\[Link\]](#)[\[Highlight\]](#)[\[SynForm\]](#)
7. Zhang, W.-J.; Nafady, A.; Shan, C.; Wojtas, L.; Chen, Y.-S.; Cheng, Q.-G.; Zhang, X. P.; Ma, S.-Q. "Functional Porphyrinic Metal-Organic Framework as a New Class of Heterogeneous Halogen Bond Donor Catalyst" *Angew. Chem. Int. Ed.* **2021**, *60*, 24312–24317. [\[Link\]](#)
8. Xie, J.-J.; Xu, P.; Zhu, Y.-L.; Wang, J.-Y.; Lee, W.-C. C.; Zhang, X. P. "New Catalytic Radical Process Involving 1,4-Hydrogen Atom Abstraction: Asymmetric Construction of Cyclobutanones" *J. Am. Chem. Soc.* **2021**, *143*, 111670–111678. [\[Link\]](#)
9. Wang, X.-X.; Ke, J.; Zhu, Y.-L.; Deb, A.; Xu, Y.-J.; Zhang, X. P. "Asymmetric Radical Process for General Synthesis of Chiral Heteroaryl Cyclopropanes" *J. Am. Chem. Soc.* **2021**, *143*, 11121–11129. [\[Link\]](#)
10. Zhang, C.-Z.; Wang, D.-S.; Lee, W.-C. C.; McKillop, A. M.; Zhang, X. P. "Controlling Enantioselectivity and Diastereoselectivity in Radical Cascade Cyclization for Construction of Bicyclic Structures" *J. Am. Chem. Soc.* **2021**, *143*, 11130–11140. [\[Link\]](#)
11. Lee, W.-C. C. "Metalloradical Catalysis: Radically Different Approach for Molecular Construction" *Chem* **2021**, *7*, 1402–1404. [\[Link\]](#)

12. Lee, W.-C. C.; Wang, D.-S.; Zhang, C.-Z.; Xie, J.-J.; Li, B.; Zhang, X. P. "Asymmetric Radical Cyclopropanation of Dehydroaminocarboxylates: Stereoselective Synthesis of Cyclopropyl α -Amino Acids" *Chem* **2021**, *7*, 1588–1601. [\[Link\]](#)
13. Magnuson, Z. L.; Cheng, Q.-G.; Zhang, W.-J.; Chen, Y.-S.; Wojtas, L.; Nafady, A.; Al-Enizi, A. M.; Larsen, R. W.; Zhang, X. P.; Ma, S.-Q. "Two Manganese Metalloporphyrin Frameworks Constructed from a Custom-Designed Porphyrin Ligand Exhibiting Selective Uptake of CO₂ over CH₄ and Catalytic Activity for CO₂ Fixation" *Cryst. Growth Des.* **2021**, *21*, 2786–2792. [\[Link\]](#)
14. Riart-Ferrer, X.; Sang, P.; Tao, J.-R.; Xu, H.; Jin, L.-M.; Lu, H.-J.; Cui, X.; Wojtas, L.; Zhang, X. P. "Metalloradical Activation of Carbonyl Azides for Enantioselective Radical Aziridination" *Chem* **2021**, *7*, 1120–1134. [\[Link\]](#)
15. Lang, K.; Li, C.-Q.; Kim, I.; Zhang, X. P. "Enantioconvergent Amination of Racemic Tertiary C–H Bonds" *J. Am. Chem. Soc.* **2020**, *142*, 20902–20911. [\[Link\]](#)
16. Jin, L.-M.; Xu, P.; Xie, J.-J.; Zhang, X. P. "Enantioselective Intermolecular Radical C–H Amination" *J. Am. Chem. Soc.* **2020**, *142*, 20828–20836. [\[Link\]](#)
17. Hu, Y.; Lang, K.; Li, C.-Q.; Gill, J. B.; Kim, I.; Lu, H.-J.; Fields, K. B.; Marshall, M. K.; Cheng, Q.-G.; Cui, X.; Wojtas, L.; Zhang, X. P. "Enantioselective Radical Construction of 5-Membered Cyclic Sulfonamides by Metalloradical C–H Amination" *J. Am. Chem. Soc.* **2019**, *141*, 18160–18169. [\[Link\]](#)
18. Lang, K.; Torker, S.; Wojtas, L.; Zhang, X. P. "Asymmetric Induction and Enantiodivergence in Catalytic Radical C–H Amination via Enantiodifferentiative H-Atom Abstraction and Stereoretentive Radical Substitution" *J. Am. Chem. Soc.* **2019**, *141*, 12388–12396. [\[Link\]](#)
19. Hu, Y.; Lang, K.; Tao, J.-R.; Marshall, M. K.; Cheng, Q.-G.; Cui, X.; Wojtas, L.; Zhang, X. P. "Next-Generation D₂-Symmetric Chiral Porphyrins for Cobalt(II)-Based Metalloradical Catalysis: Catalyst Engineering by Distal Bridging" *Angew. Chem. Int. Ed.* **2019**, *58*, 2670–2674. [\[Link\]](#)
20. Li, C.-Q.; Lang, K.; Lu, H.-J.; Hu, Y.; Cui, X.; Wojtas, L.; Zhang, X. P. "Catalytic Radical Process for Enantioselective Amination of C(sp³)–H Bonds" *Angew. Chem. Int. Ed.* **2018**, *57*, 16837–16841. [\[Link\]](#) [Highlighted in [Science](#)] [Highlighted in [Organic Chemistry Portal](#)]
21. Wen, X.; Wang, Y.; Zhang, X. P. "Enantioselective Radical Process for Synthesis of Chiral Indolines by Metalloradical Alkylation of Diverse C(sp³)–H Bonds" *Chem. Sci.* **2018**, *9*, 5082–5086. [\[Link\]](#)
22. Wang, Y.; Wen, X.; Cui, X.; Zhang, X. P. "Enantioselective Radical Cyclization for Construction of 5-Membered Ring Structures by Metalloradical C–H Alkylation" *J. Am. Chem. Soc.* **2018**, *140*, 4792–4796. [\[Link\]](#)
23. Wang, Y.; Zhang, X. P. "[Co(3,5-Di-*t*-Bu-QingPhyrin)]" e-EROS, John Wiley & Sons, **2018**; DOI: 10.1002/047084289X.rn02204. [\[Link\]](#)
24. Wang, Y.; Zhang, X. P. "[Co(3,5-Di-*t*-Bu-Xu(2'-Naph)Phyrin)]" e-EROS, John Wiley & Sons, **2018**; DOI: 10.1002/047084289X.rn02203. [\[Link\]](#)
25. Wang, Y.; Zhang, X. P. "[Co(3,5-Di-*t*-Bu-ChenPhyrin)]" e-EROS, John Wiley & Sons, **2018**; DOI: 10.1002/047084289X.rn02202. [\[Link\]](#)

26. Wang, Y.; Zhang, X. P. “[Co(3,5-Di-*t*-Bu-IbuPhyrin)]” e-EROS, John Wiley & Sons, **2018**; DOI: 10.1002/047084289X.rm02201. [\[Link\]](#)
27. Wang, Y.; Zhang, X. P. “[Co(3,5-DiMeO-ZhuPhyrin)]” e-EROS, John Wiley & Sons, **2018**; DOI: 10.1002/047084289X.rm02200. [\[Link\]](#)
28. Jiang, H.-L.; Lang, K.; Lu, H.-J.; Wojtas, L.; Zhang, X. P. “Asymmetric Radical Bicyclization of Allyl Azidoformates via Cobalt(II)-Based Metalloradical Catalysis” *J. Am. Chem. Soc.* **2017**, *139*, 9164–9167. [\[Link\]](#)
29. Xu, X.; Wang, Y.; Cui, X.; Wojtas, L.; Zhang, X. P. “Metalloradical Activation of α -Formyldiazoacetates for Catalytic Asymmetric Radical Cyclopropanation of Alkenes” *Chem. Sci.* **2017**, *8*, 4347–4351. [\[Link\]](#)
30. Wang, Y.; Wen, X.; Cui, X.; Wojtas, L.; Zhang, X. P. “Asymmetric Radical Cyclopropanation of Alkenes with In Situ-Generated Donor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis” *J. Am. Chem. Soc.* **2017**, *139*, 1049–1052. [\[Link\]](#)
31. Pegis, M. L.; McKeown, B. A.; Kumar, N.; Lang, K.; Wasylenko, D. J.; Zhang, X. P.; Raugei, S.; Mayer, J. M. “Homogenous Electrocatalytic Oxygen Reduction Rates Correlate with Reaction Overpotential in Acidic Organic Solutions” *ACS Cent. Sci.* **2016**, *2*, 850–856. [\[Link\]](#)
32. Jiang, H.-L.; Lang, K.; Lu, H.-J.; Wojtas, L.; Zhang, X. P. “Intramolecular Radical Aziridination of Allylic Sulfamoyl Azides via Co(II)-Based Metalloradical Catalysis: Effective Construction of Strained heterobicyclic Structures” *Angew. Chem. Int. Ed.* **2016**, *55*, 11604–11608. [\[Link\]](#)
33. Lu, H.-J.; Lang, K.; Jiang, H.-L.; Wojtas, L.; Zhang, X. P. “Intramolecular 1,5-C(sp³)-H Radical Amination via Co(II)-Based Metalloradical Catalysis for Five-Membered Cyclic Sulfamides” *Chem. Sci.* **2016**, DOI: 10.1039/C6SC02231F. [\[Link\]](#)
34. Liu, Q.-J.; Wang, L.-J.; Kang, Q.-K.; Zhang, X. P.; Tang, Y. “Cy-SaBOX/Copper(II)-Catalyzed Highly Diastereo- and Enantioselective Synthesis of Bicyclic N,O Acetals” *Angew. Chem. Int. Ed.* **2016**, *55*, 9220–9223. [\[Link\]](#)
35. Liu, Q.-J.; Yan, W.-G.; Wang, L.-J.; Zhang, X. P.; Tang, Y. “One-Pot Catalytic Asymmetric Synthesis of Tetrahydrocarbazoles” *Org. Lett.* **2015**, *17*, 4014–4017. [\[Link\]](#)
36. Goswami, M.; Lyaskovskyy, V.; Domingos, S. R.; Buma, W. J.; Woutersen, S.; Troepfner, O.; Ivanovic-Burmazovic, I.; Lu, H.-J.; Cui, X.; Zhang, X. P.; Reijerse, E. J.; DeBeer S.; van Schooneveld, M. M.; Pfaff, F.; Ray, K.; de Bruin, B. “Characterization of Porphyrin-Co(III)-‘Nitrene Radical’ Species Relevant in Catalytic Nitrene Transfer Reactions” *J. Am. Chem. Soc.* **2015**, *137*, 5468–5479. [\[Link\]](#)
37. Subbarayan, V.; Jin, L.-M.; Cui, X.; Zhang, X. P. “Room Temperature Activation of Aryloxysulfonyl Azides by [Co(II)(TPP)] for Selective Radical Aziridination of Alkenes via Metalloradical Catalysis” *Tetrahedron Lett.* **2015**, *56*, 3431–3434. [\[Link\]](#)
38. Cui, X.; Xu, X.; Jin, L.-M.; Wojtas, L.; Zhang, X. P. “Stereoselective Radical C–H Alkylation with Acceptor/Acceptor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis” *Chem. Sci.* **2015**, *6*, 1219–1224. [\[Link\]](#)
39. Jin, C.-Y.; Decker, A. M.; Huang, X.-P.; Gilmour, B. P.; Blough, B. E.; Roth, B. L.; Hu, Y.; Gill, J. B.; Zhang, X. P. “Synthesis, Pharmacological Characterization, and Structure-

- Activity Relationship Studies of Small Molecular Agonists for the Orphan GPR88” *ACS Chem. Neurosci.* **2014**, *5*, 576–587. [\[Link\]](#)
40. Lu, H.-J.; Li, C.-Q.; Jiang, H.-L.; Lizardi, C. L.; Zhang, X. P. “Chemoselective Amination of Propargylic C(sp³)-H Bonds via Co(II)-Based Metalloradical Catalysis” *Angew. Chem. Int. Ed.* **2014**, *53*, 7028–7032. [\[Link\]](#)
 41. Tao, J.-R.; Jin, L.-M.; Zhang, X. P. “Synthesis of Chiral *N*-Phosphoryl Aziridines through Enantioselective Aziridination of Alkenes With Phosphoryl Azide via Co(II)-Based Metalloradical Catalysis” *Beilstein J. Org. Chem.* **2014**, *10*, 1282–1289. [\[Link\]](#)
 42. Ruppel, J. V.; Cui, X.; Xu, X.; Zhang, X. P. “Stereoselective Intramolecular Cyclopropanation of alpha-Diazoacetates via Co(II)-Based Metalloradical Catalysis” *Org. Chem. Front.* **2014**, *1*, 515–520. [\[Link\]](#)
 43. Jin, L.-M.; Lu, H.-J.; Cui, Y.; Lizardi, C. L.; Arzua, T. N.; Wojtas, L.; Cui, X.; Zhang, X. P. “Selective Radical Amination of Aldehydic C(sp²)-H Bonds with Fluoroaryl Azides via Co(II)-Based Metalloradical Catalysis: Synthesis of *N*-Fluoroaryl Amides from Aldehydes under Neutral and Nonoxidative Conditions” *Chem. Sci.* **2014**, *5*, 2422–2427. [\[Link\]](#)
 44. Paul, N. D.; Mandal, S.; Otte, M.; Cui, X.; Zhang, X. P.; de Bruin, B. “A Metalloradical Approach to 2*H*-Chromenes” *J. Am. Chem. Soc.* **2014**, *136*, 1090–1096. [\[Link\]](#)
 45. Cui, X.; Zhang, X. P. “Asymmetric C–H Functionalization by Transition Metal-Catalyzed Carbene Transfer Reactions” In *Comprehensive Organic Synthesis II (Second Edition)* Eds. Knochel, P.; Molander, G.; Amsterdam: Elsevier, **2014**, Vol. 7, pp. 86–120. [\[Link\]](#)
 46. Maza, W. A.; Vetromile, G. M.; Kim, C.-S.; Xu, X.; Zhang, X. P.; Larsen, R. W. “Spectroscopic Investigation of the Noncovalent Association of the Nerve Agent Simulant Diisopropyl Methylphosphonate (DIMP) with Zinc(II)porphyrins” *J. Phys. Chem. A.* **2013**, *117*, 11308–11315. [\[Link\]](#)
 47. Xu, X.; Zhu, S.-F.; Cui, X.; Wojtas, L.; Zhang, X. P. “Cobalt(II)-Catalyzed Asymmetric Olefin Cyclopropanation with α -Ketodiazooacetates” *Angew. Chem. Int. Ed.* **2013**, *52*, 11857–11861. [\[Link\]](#) [Highlighted in [Synfacts](#)]
 48. Paul, N. D.; Lu, H.-J.; Zhang, X. P.; de Bruin, B. “Carbene Radicals in Cobalt(II) Porphyrin-Catalyzed Carbene Carbonylation Reactions: A Catalytic Approach to Ketenes” *Chem. Eur. J.* **2013**, *19*, 12953–12958. [\[Link\]](#)
 49. Liu, L.; Xie, H.; Bostic, H. E.; Jin, L.-M.; Best, D. B.; Zhang, X. P.; Zhan, W. “Effects of Oriented Surface Dipole on Photoconversion Efficiency in an Alkane/Lipid-Hybrid-Bilayer-Based Photovoltaic Model System” *ChemPhysChem* **2013**, *14*, 2777–2785. [\[Link\]](#)
 50. Cui, X.; Zhang, X. P. “Cobalt-Mediated Carbene Transfer Reactions” In *Contemporary Carbene Chemistry*; eds. Moss, R. A.; Doyle, M. P.; John Wiley & Sons, **2013**, Chapter 15, 491–525. [\[Link\]](#)
 51. Jin, L.-M.; Xu, X.; Lu, H.; Cui, X.; Wojtas, L.; Zhang, X. P. “Effective Synthesis of Chiral *N*-Fluoroaryl Aziridines via Enantioselective Aziridination of Alkenes with Fluoroaryl Azides” *Angew. Chem. Int. Ed.* **2013**, *52*, 5309–5313. [\[Link\]](#) [Highlighted in [Synfacts](#)] [Highlighted in [Organic Chemistry Portal](#)]
 52. Cui, X.; Xu, X.; Wojtas, L.; Kim, M. M.; Zhang, X. P. “Regioselective Synthesis of Multisubstituted Furans via Metalloradical Cyclization of Alkynes with alpha-Diazocarbonyls: Construction of Functionalized alpha-Oligofurans” *J. Am. Chem. Soc.*

- 2012**, 134, 19981–19984. [[Link](#)] [Highlighted in [SynForm](#)] [Highlighted in [Organic Chemistry Portal](#)]
53. Lu, H.-J.; Jiang, H.-L.; Hu, Y.; Wojtas, L.; Zhang, X. P. “Stereoselective Radical Amination of Electron-Deficient C(sp³)–H Bonds by Co(II)-Based Metalloradical Catalysis: Synthesis of alpha-Amino Acid Derivatives via alpha-C–H Amination of Esters and Amides” *Org. Lett.* **2012**, 14, 5158–5161. [[Link](#)]
 54. Meng, L.; Cheng, Q.; Kim, C.-S.; Gao, W.-Y.; Wojtas, L.; Chen, Y.-S.; Zaworotko, M. J.; Zhang, X. P.; Ma, S.-Q. “Crystal Engineering of a Microporous, Catalytically Active fcu Topology MOF Using a Custom-Designed Metalloporphyrin Linker” *Angew. Chem. Int. Ed.* **2012**, 51, 10082–10085. [[Link](#)] [Selected as [Hot Paper](#)]
 55. Jiang, H.-L.; Zhang, X. P. “Oxidation: C–N Bond Formation by Oxidation (Aziridines)” In *Comprehensive Chirality*; eds. Carreira, E. M.; Yamamoto, H.; Amsterdam: Elsevier, **2012**, Vol. 5, pp. 168–182. [[Link](#)]
 56. Wang, X.-S.; Chrzanowski, M.; Gao, W.-Y.; Kim, C.-S.; Wojtas, L.; Chen, Y.-S.; Zhang, X. P.; Ma, S.-Q. “Quest for Highly Porous Metal-Metalloporphyrin Framework Based upon A Custom-Designed Octatopic Porphyrin Ligand” *Chem. Commun.* **2012**, 48, 7173–7175. [[Link](#)]
 57. Hu, Y.; Zhang, X. P. “Selective Olefination of Carbonyl Compounds via Metal-Catalyzed Carbene Transfer from Diazo Reagents” *Top. Curr. Res.* **2012**, 327, 147–162. [[Link](#)]
 58. Zhu, S.-F.; Cui, X.; Zhang, X. P. “Ligand Effect on Cobalt(II)-Catalyzed Asymmetric Cyclopropanation with Diazosulfones: Approaching High Stereoselectivity through Modular Design of D₂-Symmetric Chiral Porphyrins” *Eur. J. Inorg. Chem.* **2012**, 430–434. [[Link](#)]
 59. Burda, W. N.; Fields, K. B.; Gill, J. B.; Burt, R.; Shepherd, M.; Zhang, X. P.; Shaw, L. N. “Neutral Metallated and Meso-Substituted Porphyrins as Antimicrobial Agents Against Gram-Positive Pathogens” *Eur. J. Clin. Microbiol. Infect. Dis.* **2012**, 31, 327–335. [[Link](#)]
 60. Cui, X.; Zhang, X. P. “Iron(III) meso-Tetraphenylporphine Chloride” e-EROS, John Wiley & Sons, **2012**; DOI: 10.1002/047084289X.rm01388. [[Link](#)]
 61. Wang, X.-S.; Meng, L.; Cheng, Q.-G.; Kim, C.-S.; Wojtas, L.; Chrzanowski, M.; Chen, Y.-S.; Zhang, X. P.; Ma, S.-Q. “A Three-Dimensional Porous Metal-Metalloporphyrin Framework Consisting of Nanoscopic Polyhedral Cages with a High Density of Open Metal Sites” *J. Am. Chem. Soc.* **2011**, 133, 16322–16325. [[Link](#)]
 62. Lu, H.-J.; Jiang, H.-L.; Hu, Y.; Wojtas, L.; Zhang, X. P. “Chemoselective Intramolecular Allylic C–H Amination over C=C Aziridination through Co(II)-Based Metalloradical Catalysis” *Chem. Sci.* **2011**, 2, 2361–2366. [[Link](#)] [Highlighted in [Organic Chemistry Portal](#)]
 63. Xu, X.; Lu, H.-J.; Ruppel, J. V.; Cui, X.; de Mesa, S. L.; Wojtas, L.; Zhang, X. P. “Highly Asymmetric Intramolecular Cyclopropanation of Acceptor-Substituted Diazoacetates by Co(II)-Based Metalloradical Catalysis: Iterative Approach for Development of New Generation Catalysts” *J. Am. Chem. Soc.* **2011**, 133, 15292–15295. [[Link](#)] [Highlighted in [Synfacts](#)]
 64. Lyaskovskyy, V.; Suarez, A. I. O.; Lu, H.-J.; Jiang, H.-L.; Zhang, X. P.; de Bruin, B. “Mechanism of Cobalt(II) Porphyrin-Catalyzed C–H Amination with Organic Azides: Radical Nature and H-Atom Abstraction Ability of Cobalt(III)-Nitrene Key Intermediates” *J. Am. Chem. Soc.* **2011**, 133, 12264–12273. [[Link](#)]

65. Lu, H.-J.; Dzik, W. I.; Xu, X.; Wojtas, L.; de Bruin, B.; Zhang, X. P. "Experimental Evidence for Cobalt(III)-Carbene Radicals: Key Intermediates in Cobalt(II)-Based Metalloradical Cyclopropanation" *J. Am. Chem. Soc.* **2011**, *133*, 8518–8521. [\[Link\]](#)
66. Belof, J. L.; Cioce, C. R.; Xu, X.; Zhang, X. P.; Space, B.; Woodcock, H. L. "Characterization of Tunable Radical Metal-Carbenes: Key Intermediates in Catalytic Cyclopropanation", *Organometallics* **2011**, *30*, 2739–2746. [\[Link\]](#)
67. Dzik, W. I.; Zhang, X. P.; de Bruin, B. "The Redox Non-Innocence of Carbene Ligands: Carbene Radicals in (Catalytic) C-C Bond Formation" *Inorg. Chem.* **2011**, *50*, 9896–9903. [\[Link\]](#)
68. Uygun, A.; Myjavcova, R.; Yavuz, A. G.; Ruppel, J. V.; Fields, K. B.; Frankhauser, A.; Zhang, X. P.; Bhethanbotla, V. R.; Bednar, P. "Electrochemical Polymerization and Investigation of Properties of Poly(5-(4'-aminophenylamino)-10,20-diphenylporphyrin)" *Electroanalysis* **2011**, *23*, 1158–1167. [\[Link\]](#)
69. Suarez, A. I. O.; Jiang, H.-L.; Zhang, X. P.; de Bruin, B. "The Radical Mechanism of Cobalt(II) Porphyrin-Catalyzed Olefin Aziridination and the Importance of Cooperative H-Bonding" *Dalton Trans.* **2011**, *40*, 5697–5705. [\[Link\]](#)
70. Cui, X.; Xu, X.; Lu, H.-J.; Zhu, S.-F.; Wojtas, L.; Zhang, X. P. "Enantioselective Cyclopropanation of Alkynes with Acceptor/Acceptor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis" *J. Am. Chem. Soc.* **2011**, *133*, 3304–3307. [\[Link\]](#) [Highlighted in [Synfacts](#)]
71. Lu, H.-J.; Zhang, X. P. "Catalytic C–H Functionalization by Metalloporphyrins: Recent Development and Future Directions" *Chem. Soc. Rev.* **2011**, *40*, 1899–1909. [\[Link\]](#)
72. Fields, K. B.; Engle, J. T.; Sripathongnak, S.; Kim, C.-S.; Zhang, X. P.; Ziegler, C. J. "Cobalt Carbaporphyrin-Catalyzed Cyclopropanation" *Chem. Commun.* **2011**, *47*, 749. [\[Link\]](#)
73. Lu, H.-J.; Jiang, H.-L.; Wojtas, L.; Zhang, X. P. "Selective Intramolecular C–H Amination via Metalloradical Activation of Azides: Synthesis of 1,3-Diamines under Neutral and Nonoxidative Conditions" *Angew. Chem. Int. Ed.* **2010**, *49*, 10192–10196. [\[Link\]](#) [Selected as [Hot Paper](#)][Highlighted in [Organic Chemistry Portal](#)]
74. Zhan, W.; Jiang, K.; Smith, M. D.; Bostic, H. E.; Best, M. D.; Auad, M. L.; Ruppel, J. V.; Kim, C.-S.; Zhang, X. P. "Photocurrent Generation from Porphyrin/Fullerene Complexes Assembled in a Tethered Lipid Bilayer" *Langmuir* **2010**, *26*, 15671–15679. [\[Link\]](#)
75. Hilker, B.; Fields, K. B.; Stern, A.; Space, B.; Zhang, X. P.; Harmon, J. P. "Dielectric Analysis of Poly(methyl methacrylate) Zinc(II) Mono-pinacolborane Diphenylporphyrin Composites" *Polymer* **2010**, *51*, 4790–4805. [\[Link\]](#)
76. Zhu, S.-F.; Xu, X.; Perman, J. A.; Zhang, X. P. "A General and Efficient Cobalt(II)-Based Catalytic System for Highly Stereoselective Cyclopropanation of Alkenes with α -Cyano-Diazoacetates" *J. Am. Chem. Soc.* **2010**, *132*, 12796–12799. [\[Link\]](#) [Highlighted in [Synfacts](#)] [Highlighted in [Organic Chemistry Portal](#)]
77. Dzik, W. I.; Xu, X.; Zhang, X. P.; Reek, J. N. H.; de Bruin, B. "Carbene Radicals' in Co^{II}(por)-Catalyzed Olefin Cyclopropanation" *J. Am. Chem. Soc.* **2010**, *132*, 10891–10902. [\[Link\]](#)

78. Lu, H.-J.; Tao, J.-R.; Jones, J. E.; Wojtas, L.; Zhang, X. P. "Co(II)-Catalyzed Intramolecular C–H Amination of Phosphoryl Azides: Formation of 6- and 7-Membered Cyclophosphoramidates" *Org. Lett.* **2010**, *12*, 1248–1251. [\[Link\]](#) [Highlighted in [Synfacts](#)]
79. Lu, H.-J.; Subbarayan, V.; Tao, J.; Zhang, X. P. "Cobalt-Catalyzed Intermolecular Benzylic C–H Amination with 2,2,2-Trichloroethoxycarbonyl Azide (TrocN₃)" *Organometallics* **2010**, *29*, 389–393. [\[Link\]](#)
80. Ruppel, J. V.; Fields, K. B.; Snyder, N. L.; Zhang, X. P. "Metalloporphyrin-Catalyzed Asymmetric Atom/Group Transfer Reactions" In *Handbook of Porphyrin Science*; eds. Kadish, K. M.; Smith, K. M.; Guillard, R.; World Scientific, **2010**, Vol. 10, Chapter 43, pp. 1–84. [\[Link\]](#)
81. Fields, K. B.; Ruppel, J. V.; Snyder, N. L.; Zhang, X. P. "Porphyrin Functionalization via Carbon-Heteroatom Cross-Coupling Reactions" In *Handbook of Porphyrin Science*; eds. Kadish, K. M.; Smith, K. M.; Guillard, R.; World Scientific, **2010**, Vol. 3, Chapter 13, pp. 367–428. [\[Link\]](#)
82. Subbarayan, V.; Ruppel, J. V.; Zhu, S.-F.; Perman, J. A.; Zhang, X. P. "Highly Asymmetric Cobalt-Catalyzed Aziridination of Alkenes with Trichloroethoxysulfonyl Azide (TcesN₃)" *Chem. Commun.* **2009**, 4266–4268. [\[Link\]](#)
83. Ruppel, J. V.; Gauthier, T. J.; Snyder, N. L.; Perman, J. A.; Zhang, X. P. "Asymmetric Cobalt-Catalyzed Cyclopropanation with Succinimidyl Diazoacetate: General Synthesis of Optically Active Cyclopropyl Carboxamides" *Org. Lett.* **2009**, *11*, 2273–2276. [\[Link\]](#) [Highlighted in [Organic Chemistry Portal](#)]
84. Zhu, S.-F.; Zhang, X. P. "Cobalt(II) Acetate" e-EROS, John Wiley & Sons, **2009**; DOI: 10.1002/047084289X.rc182.pub2. [\[Link\]](#)
85. Zhu, S.-F.; Perman, J. A.; Zhang, X. P. "Acceptor/Acceptor-Substituted Diazo Reagents for Carbene Transfers: Cobalt-Catalyzed Asymmetric (Z)-Cyclopropanation of Alkenes with α -Nitro-Diazoacetates" *Angew. Chem. Int. Ed.* **2008**, *47*, 8460–8463. [\[Link\]](#) [Highlighted in [Angew. Chem. Int. Ed.](#)] [Highlighted in [Synfacts](#)]
86. Jones, J. E.; Ruppel, J. V.; Gao, G.-Y.; Thomas, M. M.; Zhang, X. P. "Cobalt-Catalyzed Asymmetric Olefin Aziridination with Diphenylphosphoryl Azide" *J. Org. Chem.* **2008**, *73*, 7260–7265. [\[Link\]](#)
87. Gao, G.-Y.; Ruppel, J. V.; Fields, K. B.; Xu, X.; Chen, Y.; Zhang, X. P. "Synthesis of Diporphyrins via Palladium-Catalyzed C–O Bond Formation: Effective Access to Chiral Diporphyrins" *J. Org. Chem.* **2008**, *73*, 4855–4858. [\[Link\]](#)
88. Ruppel, J. V.; Jones, J. E.; Huff, C. A.; Kamble, R. M.; Chen, Y.; Zhang, X. P. "A Highly Effective Cobalt Catalyst for Olefin Aziridination with Azides: Hydrogen Bonding-Guided Catalyst Design" *Org. Lett.* **2008**, *10*, 1995–1998. [\[Link\]](#)
89. Zhu, S.; Ruppel, J. V.; Lu, H.; Wojtas, L.; Zhang, X. P. "Cobalt-Catalyzed Asymmetric Cyclopropanation with Diazosulfones: Rigidification and Polarization of Ligand Chiral Environment via Hydrogen Bonding and Cyclization" *J. Am. Chem. Soc.* **2008**, *130*, 5042–5043. [\[Link\]](#) [Highlighted in [Angew. Chem. Int. Ed.](#)] [Highlighted in [Synfacts](#)]
90. Gao, G. Y.; Ruppel, J. V.; Allen, D. B.; Chen, Y.; Zhang, X. P. "Synthesis of beta-Functionalized Porphyrins via Palladium-Catalyzed Carbon–Heteroatom Bond Formations: Expedient Entry into beta-Chiral Porphyrins" *J. Org. Chem.* **2007**, *72*, 9060–9066. [\[Link\]](#)

91. Harden, J. D.; Ruppel, J. V.; Gao, G.-Y.; Zhang, X. P. "Cobalt-Catalyzed Intermolecular C–H Amination with Bromamine-T as Nitrene Source" *Chem. Comm.* **2007**, 4644–4646. [\[Link\]](#)
92. Ruppel, J. V.; Kamble, R. M.; Zhang, X. P. "Cobalt-Catalyzed Intramolecular C–H Amination with Arylsulfonyl Azides" *Org. Lett.* **2007**, 9, 4889–4892. [\[Link\]](#)
93. Chen, Y.; Ruppel, J. V.; Zhang, X. P. "Cobalt-Catalyzed Asymmetric Cyclopropanation of Electron-Deficient Olefins" *J. Am. Chem. Soc.* **2007**, 129, 12074–12075. [\[Link\]](#) [Highlighted in [Angew. Chem. Int. Ed.](#)] [Highlighted in [Synfacts](#)] [Highlighted in [Organic Chemistry Portal](#)]
94. Chen, Y.; Zhang, X. P. "Asymmetric Cyclopropanation of Styrenes Catalyzed by Metal Complexes of *D*₂-Symmetrical Chiral Porphyrin: Superiority of Cobalt over Iron" *J. Org. Chem.* **2007**, 72, 5931–5934. [\[Link\]](#) [Highlighted in [Synfacts](#)]
95. Gao, G.-Y.; Jones, J. E.; Vyas, R.; Harden, J. D.; Zhang, X. P. "Cobalt-Catalyzed Aziridination with Diphenylphosphoryl Azide (DPPA): Direct Synthesis of *N*-Phosphorous-Substituted Aziridines from Alkenes" *J. Org. Chem.* **2006**, 71, 6655–6658. [\[Link\]](#)
96. Chen, Y.; Zhang, X. P. "Trans Effect on Cobalt Porphyrin Catalyzed Asymmetric Cyclopropanation" *Synthesis* **2006**, No.10, 1697–1700. (Invited Contribution to Special Topic) [\[Link\]](#)
97. Gao, G.-Y.; Harden, J. D.; Zhang, X. P. "Cobalt-Catalyzed General and Efficient Aziridination of Alkenes" *Org. Lett.* **2005**, 7, 3191–3193. [\[Link\]](#)
98. Chen, Y.; Gao, G.-Y.; Zhang, X. P. "Palladium-Mediated Synthesis of Novel *meso*-Chiral Porphyrins for Cobalt-Catalyzed Cyclopropanation" *Tetrahedron Lett.* **2005**, 46, 4965–4969. [\[Link\]](#)
99. Baskaran, D.; Mays, J. W.; Zhang, X. P.; Bratcher, M. S. "Carbon Nanotubes with Covalently Linked Porphyrin Antennae: Photoinduced Electron Transfer" *J. Am. Chem. Soc.* **2005**, 127, 6916–6917. [\[Link\]](#)
100. Gao, G.-Y.; Colvin, A. J.; Chen, Y.; Zhang, X. P. "Synthesis of *meso*-Arylsulfanyl- and Alkylsulfanyl-Substituted Porphyrins via Palladium-Mediated C–S Bond Formation" *J. Org. Chem.* **2004**, 69, 8886–8892. [\[Link\]](#)
101. Chen, Y.; Fields, K. B.; Zhang, X. P. "Bromoporphyrins as Versatile Synthons for Modular Construction of Chiral Porphyrins: Cobalt-Catalyzed Highly Enantioselective and Diastereoselective Cyclopropanation" *J. Am. Chem. Soc.* **2004**, 126, 14718–14719. [\[Link\]](#) [Highlighted in [Angew. Chem. Int. Ed.](#)]
102. Vyas, R.; Gao, G.-Y.; Harden, J. D.; Zhang, X. P. "Iron(III) Porphyrin-Catalyzed Aziridination of Alkenes with Bromamine-T as Nitrene Source" *Org. Lett.* **2004**, 6, 1907–1910. [\[Link\]](#)
103. Gao, G.-Y.; Chen, Y.; Zhang, X. P. "General Synthesis of *meso*-Amidoporphyrins via Palladium-Catalyzed Amidation" *Org. Lett.* **2004**, 6, 1837–1840. [\[Link\]](#)
104. Chen, Y.; Zhang, X. P. "Vitamin B₁₂ Derivatives as Natural Asymmetric Catalysts: Enantioselective Cyclopropanation of Alkenes" *J. Org. Chem.* **2004**, 69, 2431–2435. [\[Link\]](#)
105. Lee, M.-Y.; Chen, Y.; Zhang, X. P. "General and Selective Olefination of Aldehydes and Ketones Catalyzed by a Cobalt(II) Porphyrin Complex" *Organometallics* **2003**, 22, 4905–4909. [\[Link\]](#)

106. Huang, L.; Chen, Y.; Gao, G.-Y.; Zhang, X. P. "Diastereoselective and Enantioselective Cyclopropanation of Alkenes Catalyzed by Cobalt Porphyrins" *J. Org. Chem.* **2003**, *68*, 8179–8184. [\[Link\]](#)
107. Gao, G.-Y.; Colvin, A. J.; Chen, Y.; Zhang, X. P. "Versatile Synthesis of *meso*-Aryloxy- and Alkoxy-Substituted Porphyrins via Palladium-Catalyzed C–O Cross-Coupling Reactions" *Org. Lett.* **2003**, *5*, 3261–3264. [\[Link\]](#)
108. Gao, G.-Y.; Chen, Y.; Zhang, X. P. "General and Efficient Synthesis of Arylamino- and Alkylamino-Substituted Diphenylporphyrins and Tetraphenylporphyrins via Palladium-Catalyzed Multiple Amination Reactions" *J. Org. Chem.* **2003**, *68*, 6215–6221. [\[Link\]](#)
109. Chen, Y.; Huang, L.; Zhang, X. P. "Acid-Promoted Olefination of Ketones by Iron(III) Porphyrin Complex" *Org. Lett.* **2003**, *5*, 2493–2496. [\[Link\]](#)
110. Chen, Y.; Huang, L.; Zhang, X. P. "Efficient and Stereoselective Synthesis of beta-Trifluoromethyl-alpha, beta-Unsaturated Esters via Iron(III) Porphyrin-Catalyzed Olefination of Ketones" *J. Org. Chem.* **2003**, *68*, 5925–5929. [\[Link\]](#)
111. Chen, Y.; Zhang, X. P. "Facile and Efficient Synthesis of *meso*-Arylamino- and Alkylamino-Substituted Porphyrins via Palladium-Catalyzed Amination" *J. Org. Chem.* **2003**, *68*, 4432–4438. [\[Link\]](#)
112. Chen, Y.; Huang, L.; Ranade, M. A.; Zhang, X. P. "Iron(III) and Ruthenium(II) Porphyrin Complexes-Catalyzed Selective Olefination of Aldehydes with Ethyl Diazoacetate" *J. Org. Chem.* **2003**, *68*, 3714–3717. [\[Link\]](#)
113. Cui, W.; Zhang, X. P.; Wayland, B. B. "Bimetallo-Radical Carbon-Hydrogen Bond Activation of Methanol and Methane" *J. Am. Chem. Soc.* **2003**, *125*, 4994–4995. [\[Link\]](#)
114. Yin, J.-J.; Rainka, M. P.; Zhang, X.-X.; Buchwald, S. L. "A Highly Active Suzuki Catalyst for the Synthesis of Sterically Hindered Biaryls: Novel Ligand Coordination" *J. Am. Chem. Soc.* **2002**, *124*, 1162–1163. [\[Link\]](#)
115. Zhang, X.-X.; Harris, M. C.; Sadighi, J. P.; Buchwald, S. L. "The Use of Palladium Chloride as A Precatalyst for the Amination of Aryl Bromides" *Can. J. Chem.* **2001**, *79*, 1799–1805. [\[Link\]](#)
116. Zhang, X.-X.; Buchwald, S. L. "Efficient Synthesis of *N*-Aryl-Aza-Crown Ethers via Palladium-Catalyzed Amination" *J. Org. Chem.* **2000**, *65*, 8027–8031. [\[Link\]](#)
117. Zhang, X.-X.; Lippard, S. J. "A Mixed-Valent Heptairon Chloride Cluster Supported by the Porphyrin-Linked Dicarboxylate Ligand PDK" *Inorg. Chem.* **2000**, *39*, 4388–4389. [\[Link\]](#)
118. Zhang, X.-X.; Wayland, B. B. "Sterically Demanding Diporphyrin Ligands and Rhodium(II) Porphyrin Bimetallo-radical Complexes" *Inorg. Chem.* **2000**, *39*, 5318–5325. [\[Link\]](#)
119. Zhang, X.-X.; Sadighi, J. P.; Mackewitz, T. W.; Buchwald, S. L. "Efficient Synthesis of Well-Defined, High Molecular Weight, and Processible Polyanilines under Mild Conditions via Palladium-Catalyzed Amination" *J. Am. Chem. Soc.* **2000**, *122*, 7606–7607. [\[Link\]](#)
120. Zhang, X.-X.; Lippard, S. J. "Synthesis of PDK, a Novel Porphyrin-Linked Dicarboxylate Ligand" *J. Org. Chem.* **2000**, *65*, 5298–5305. [\[Link\]](#)
121. Zhang, X.-X.; Fuhrmann, P.; Lippard, S. J. "Synthesis And Triiron Complexes of PDK, A New Porphyrin-Linked Dicarboxylate Ligand" *J. Am. Chem. Soc.* **1998**, *120*, 10260–10261. [\[Link\]](#)

122. Zhang, X.-X.; Parks, F. P.; Wayland, B. B. "One-Electron Activation of CO by a Rhodium(II) Porphyrin Bimetallo-radical Complex: Concerted Reactions of Two Metalloformyl Radicals ((MCO)·)" *J. Am. Chem. Soc.* **1997**, *119*, 7938–7944. [[Link](#)]
123. Del Rossi, K. J.; Zhang, X.-X.; Wayland, B. B. "Reactions of C-H Bonds in Organic Oxygenates with Octaethylporphyrinato Rhodium(II) and Iridium(II) Dimers" *J. Organomet. Chem.* **1995**, *504*, 47–56. [[Link](#)]
124. Zhang, X.-X.; Wayland, B. B. "Rhodium(II) Porphyrin Bimetallo-radical Complexes: Preparation and Enhanced Reactivity with CH₄ and H₂" *J. Am. Chem. Soc.* **1994**, *116*, 7897–7898. [[Link](#)]
125. Francesconi, L. C.; Yang, Y. Y.; Kung, M. P.; Zhang, X.-X.; Billings, J.; Guo, Y. Z.; Kung, H. F. "Technetium-99m *N,N'*-Bis(2-mercapto-2-methylpropyl)-2-aminobenzylamine: Technetium-99m Complexes of a Novel Bis(aminoethanethiol) Ligand" *J. Med. Chem.* **1994**, *37*, 3282–3288. [[Link](#)]
126. Liu, B.-L.; Meng, Z.-X.; Zhang, X.-X.; Li, L. "Study on Structure-Activity Relationship of Cholesterol Analogs as Adrenal Imaging Agent with CNDO/2 Method" *J. Isotopes* **1992**, *5*, 1. [[Link](#)]
127. Zhang, X.-X.; Liu, B.-L. "The Structure-Activity Relationship of Cholesterol Analogs as Adrenal Imaging Agents" *J. Isotopes* **1991**, *4*, 234. [[Link](#)]
128. Zhang, X.-X.; Liu, B.-L. "New Cholesterol Analog as Adrenal Imaging Agent-Synthesis and Tissue Distribution of Bromine-82 Labeled 6-Bromomethylcholesterol" *J. Nucl. Radiochem.* **1991**, *13*, 49. [[Link](#)]
129. Zhang, X.-X.; Liu, B.-L.; Jin, Y.-T.; Kung, H. F. "Development of Tc-99m-ECD as a New Brain Imaging Agent II. Kinetics of Ligand Exchange, Stability and Clinical Evaluation" *J. Isotopes* **1990**, *3*, 137. [[Link](#)]
130. Zhang, X.-X.; Liu, B.-L.; Jin, Y.-T.; Kung, H. F. "Development of Tc-99m-ECD as a New Brain Imaging Agent I. Synthesis and Labeling" *J. Isotopes* **1990**, *3*, 73. [[Link](#)]
131. Pan, Z.-Y.; Jin, Y.-T.; Liu, B.-L.; Zhang, X.-X. "Monkey and Human SPECT rCBF Imaging with Tc-99m-ECD" *J. Nucl. Med.* **1989**, *9*, 210. [[Link](#)]

F. ISSUED PATENTS

1. Zhang, X. X.; Lang, K. "Catalytic Systems for Stereoselective Synthesis of Chiral Amines by Enantiodivergent Radical C–H Amination" *U.S. Patent 11,161,827* (November 2, **2021**).
2. Zhang, X. P.; Hu, Y. "Compositions and Methods for Catalysts Based on Bridged Chiral Amidoporphyrins and Their Metal Complexes" *U.S. Patent 11,117,123* (September 14, **2021**).
3. Zhang, X. P.; Zhu, S.-F. "Cobalt-Catalyzed Asymmetric Cyclopropanation of Alkenes with alpha-Nitro-Diazoacetates" *U.S. Patent 8,110,699* (February 7, **2012**).
4. Zhang, X. P.; Ruppel, J. V. "Intramolecular C–H Amidation with Sulfonyl Azides" *U.S. Patent 7,956,193* (June 7, **2011**).
5. Zhang, X. P. "Cobalt-Catalyzed Asymmetric Cyclopropanation of Electron-Deficient Olefins" *U.S. Patent 7,847,041* (December 7, **2010**).
6. Zhang, X. P.; Chen, Y.; Gao, G.-Y. "Chiral Porphyrins, Chiral Metalloporphyrins, and Methods for Synthesis of The Same" *U.S. Patent 7,417,142* (August 26, **2008**).

7. Zhang, X. P.; Chen, Y.; Gao, G.-Y.; Colvin, A. J. "Heteroatom-Substituted Porphyrins and Methods for Synthesis of The Same" *U.S. Patent 6,951,935* (October 04, **2005**).

G. INVITED SEMINARS & TALKS

1. 28th International Society of Heterocyclic Chemistry Congress; Santa Barbara, CA; August 28-September 2, **2022**.
2. 38th Reaction Mechanisms Conference (Plenary Speaker); Boulder, CO; June 12-15, **2022**.
3. School of Chemistry and Chemical Engineering, Shandong University; Jinan, China; May 31, **2022**.
4. Department of Chemistry, University of North Texas; Denton, TX; April 8, **2022**.
5. Department of Chemistry, University of Tennessee; Knoxville, TN; March 10, **2022**.
6. Recent Trends in Amination Chemistry, International Chemical Congress of Pacific Basin Society (Pacifichem); Honolulu, Hawaii; December 16-21, **2021**.
7. Advances in C-H Functionalization, International Chemical Congress of Pacific Basin Society (Pacifichem); Honolulu, Hawaii; December 16-21, **2021**.
8. Department of Chemistry, Physics, Atmospheric Sciences, Jackson State University; Jackson, MS; November 5, **2021**.
9. The 32nd Annual Conference of Chinese Chemical Society; Zhuhai, China; April 19-22, **2021**.
10. Department of Chemistry and Biochemistry, University of Arkansas; Fayetteville, AR; March 29, **2021**.
11. Department of Chemistry and Biochemistry, San Diego State University; San Diego, CA; February 26, **2021**.
12. Bristol-Myers Squibb; Cambridge, MA; September 17, **2020**.
13. Department of Chemistry, University of Minnesota; Minneapolis, MN; March 3, **2020**.
14. The Third Symposium of Carbene and Nitrene Chemistry; San Antonio, Texas; February 5-7, **2020**.
15. Gordon Research Conference on Organometallic Chemistry; New Port, RI, July 7-12, **2019**.
16. Department of Chemistry, University of Massachusetts; Lowell, MA; March 29, **2019**.
17. Amgen; Cambridge, MA; March 14, **2019**.
18. Department of Chemistry, University of Vermont; Burlington, VT; January 16, **2019**.
19. Department of Chemistry, University California at Riverside; Riverside, CA; October 12, **2018**.
20. Department of Chemistry & Biochemistry, University California at Santa Barbara; Santa Barbara, CA; October 10, **2018**.
21. Department of Chemistry, University of Southern California; Los Angeles, CA; October 8, **2018**.
22. Firmenich SA; Geneva, Switzerland; June 22, **2018**.
23. EuChEMS Conference on Organic Free Radicals (ECOF 2018); Marseille, France; June 17-20, **2018**.
24. The Second Symposium of Metal-Carbene Consortium; Beijing, China; June 6-9, **2018**.

25. School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou, China; June 5, **2018**.
26. Department of Chemistry, Peking University Shenzhen Graduate School; Shenzhen, China; June 4, **2018**.
27. Department of Chemistry, Shenzhen University; Shenzhen, China; June 2, **2018**.
28. Department of Chemistry, South University of Science and Technology of China; Shenzhen, China; June 1, **2018**.
29. Department of Chemistry, Columbia University; New York, NY; March 8, **2018**.
30. Department of Chemistry, University of Wisconsin-Madison; Madison, WI; November 7, **2017**.
31. Bristol-Myers Squibb; New Brunswick, NJ; October 5, 2017.
32. Department of Chemistry, North Carolina State University; Raleigh, NC; September 11, **2017**.
33. College of Chemistry, Nanjing University of Science and Technology; Nanjing, China; July 18, **2017**.
34. College of Chemistry, Nanjing University; Nanjing, China; July 18, **2017**.
35. 4th EOC Symposium, College of Chemistry, Nankai University; Tianjin, China; July 15, **2017**.
36. School of Pharmaceutical Sciences, Tsinghua University; Beijing, China; July 13, **2017**.
37. Organic Synthesis Lecture; Department of Chemistry, MIT; Cambridge, MA; May 15, **2017**.
38. 8th CGCC Annual Meeting; Department of Chemistry, McGill University; Montreal, QC, Canada; May 15, **2017**.
39. Department of Chemistry, National Sun Yat-sen University; Kaohsiung, Taiwan; May 9, **2017**.
40. Department of Chemistry, National Tsing Hua University; Hsinchu, Taiwan; May 8, **2017**.
41. Department of Chemistry, National Taiwan University; Taipei, Taiwan; May 5, **2017**.
42. BRIC; Department of Chemistry, Harvard University; Cambridge, MA; April 29, **2017**.
43. School of Pharmacy, University of Iowa; Iowa City, IA; April 18, **2017**.
44. Department of Chemistry, University of Connecticut; Storrs, CT; March 29, **2017**.
45. The 6th CCHF Virtual C-H Functionalization Symposium; Atlanta, GA; March 28, **2017**.
46. Department of Chemistry & Biochemistry, Florida State University; Tallahassee, FL; March 9, **2017**.
47. Department of Chemistry, Trinity College; Hartford, CT; March 3, **2017**.
48. Department of Chemistry & Biochemistry, Worcester Polytechnic Institute; Worcester, MA; February 15, **2017**.
49. The 14th International Symposium for Chinese Organic Chemists (ISCOC-14); Singapore; December 8–10, **2016**. (Keynote Speaker)
50. Department of Chemistry, University of Illinois at Chicago; Chicago, IL; November 8, **2016**.
51. The 12th International Symposium on Organic Free Radicals (ISOFR-12); Shanghai, China; October 9–14, **2016**.
52. Department of Chemistry, Duke University; Durham, NC; September 6, **2016**.
53. Merck & Co., Inc., Boston, MA; August 11, **2016**.
54. Gordon Research Conference on Stereochemistry; New Port, RI, July 24-29, **2016**.

55. Symposium on Metalloporphyrinoids: Design, Spectroscopy and Application, 9th *International Conference on Porphyrins and Phthalocyanines (ICPP-9)*; Nanjing, China; July 3-8, **2016**.
56. 2016 International Symposium for Metal Porphyrins and Phthalocyanines; Beijing, China; July 1-2, **2016**.
57. Boehringer Ingelheim Pharmaceuticals, Inc.; Ridgefield, CT; April 1, **2016**.
58. Department of Chemistry, University of South Dakota; Vermillion, SD; March 21, **2016**.
59. Department of Chemistry, Brandeis University; Waltham, MA; March 7, **2016**.
60. Department of Chemistry & Biochemistry, Old Dominion University; Norfolk, VA; February 26, **2016**.
61. Application of C–H Functionalization, International Chemical Congress of Pacific Basin Society (Pacifichem); Honolulu, Hawaii; December 15-20, **2015**.
62. Asymmetric Supramolecular Catalysis, International Chemical Congress of Pacific Basin Society (Pacifichem); Honolulu, Hawaii; December 15-20, **2015**.
63. Department of Chemistry, University of Chicago; Chicago, IL; November 19, **2015**.
64. GlaxoSmithKline MDR-Boston; Waltham, MA; October 28, **2015**.
65. Firmenich SA; Geneva, Switzerland; September 24, **2015**.
66. Institute of Chemical Sciences and Engineering; Ecole Polytechnique Federale de Lausanne (EPFL); Lausanne, Switzerland; September 23, **2015**.
67. Ecole Polytechnique, Palaiseau, France; September 22, **2015**.
68. Pierre and Marie Curie University (UPMC); Paris, France; September 21, **2015**.
69. Department of Chemistry, Boston College, Chestnut Hill, MA; May 21, **2015**.
70. Florida Award Session, 91st Florida Annual Meeting and Exposition (FAME 2015), Innisbrook, FL; May 7-9, **2015**.
71. Organic Chemistry Session, 91st Florida Annual Meeting and Exposition (FAME 2015), Innisbrook, FL; May 7-9, **2015**.
72. Pfizer Global Research & Development, Groton, CT; April 23, **2015**.
73. Division of Chemistry and Biological Chemistry, Nanyang Technological University, Singapore; December 17, **2014**.
74. 8th Singapore International Chemistry Conference, National University of Singapore, Singapore; December 14-17, **2014**.
75. Department of Chemistry, Hong Kong University of Science and Technology, Hong Kong, China; December 12, **2014**.
76. Department of Chemistry, Boston College, Chestnut Hill, MA; November 14, **2014**.
77. Brad Wayland 50th Anniversary Symposium, Temple University, Philadelphia, PA; October 11, **2014**.
78. Chiral China 2014, Hefei, China; September 28–October 1, **2014**. (Plenary Speaker)
79. Merck Sharp & Dohme Corp, Rahway, NJ; July 23, **2014**.
80. The Future of Asymmetric Catalysis, Telluride Conference, Telluride, CO; June 24-28, **2014**.
81. Department of Chemistry & Biochemistry, University of Texas at Austin, Austin, TX; November 8, **2013**.

82. Department of Chemistry, Chemical Biology, & Biomedical Engineering, Stevens Institute of Technology, Hoboken, NJ; October 23, **2013**.
83. New Directions in Chemistry of Heterocyclic Compounds, *3rd International Conference for the Chemistry of Heterocyclic Compounds* (NDCHC-2013); Pyatigorsk, Russia; September 17-21, **2013**. (Keynote Speaker)
84. Pharmaron, Beijing, China; August 2, **2013**.
85. College of Chemistry and Molecular Engineering, Peking University, Beijing, China; August 1, **2013**.
86. College of Chemistry and Biological Engineering, University of Science and Technology Beijing, Beijing, China; July 30, **2013**.
87. Frontier Institute of Science and Technology, Xi'an Jiaotong University, Xi'an, China; July 23, **2013**.
88. Department of Chemistry, Nanjing University, Nanjing, China; December 14, **2012**.
89. Department of Chemistry, University of Minnesota, Minneapolis, MN; September 20, **2012**.
90. Symposium on Metalloporphyrin-Based Catalytic Processes, *7th International Conference on Porphyrins and Phthalocyanines* (ICPP-7); Jeju, Korea; July 1-6, **2012**.
91. Department of Chemistry and Biochemistry, University of Maryland, College Park, MD; March 1, **2012**.
92. Department of Chemistry, Temple University, Philadelphia, PA; February 15, **2012**.
93. Department of Chemistry, University of Pennsylvania, Philadelphia, PA; February 14, **2012**.
94. Department of Chemistry, Drexel University, Philadelphia, PA; February 13, **2012**.
95. Department of Chemistry, Shanghai Jiaotong University, Shanghai, China; December 21, **2011**.
96. Department of Chemistry, East China Normal University, Shanghai, China; December 20, **2011**.
97. Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, China; December 19, **2011**.
98. Department of Chemistry, Anhui Normal University, Wuhu, China; December 16, **2011**.
99. Department of Chemistry, Fudan University, Shanghai, China; December 8, **2011**.
100. Department of Chemistry, Ohio State University, Columbus, OH; October 6, **2011**.
101. USF-KAUST Symposium "New Horizon in Molecular Science 2011: Design and Application of Porous Frameworks" Department of Chemistry, University of South Florida, Tampa, FL; June 21, **2011**.
102. Department of Chemistry, Dartmouth College, Hanover, NH; May 3, **2011**.
103. Department of Chemistry, Georgia State University, Atlanta, GA; April 28, **2011**.
104. Emerson Center Lectureship Symposium "*Revolutionizing Strategies for the Carbon-Carbon and Carbon-Heteroatom Bond Formation: Interplay of Theory and Experiment*", Cherry L. Emerson Center for Scientific Computation, Emory University, Atlanta, GA; April 27, **2011**.
105. Department of Chemistry, University of Kansas; Lawrence, KS; March 17, **2011**.
106. Department of Chemistry and Biochemistry, North Dakota State University; Fargo, ND; March 10, **2011**.

107. Department of Homogeneous and Supramolecular Catalysis, Van 't Hoff Institute for Molecular Sciences (HIMS), University of Amsterdam; Amsterdam, The Netherlands; January 9–12, **2011**.
108. Department of Chemistry and Chemical Biology, University of New Mexico; Albuquerque, NM; November 5, **2010**.
109. Department of Chemistry and Biochemistry, of New Mexico State University; Las Cruces, NM; November 4, **2010**.
110. Department of Chemistry, University of Florida; Gainesville, FL; September 13, **2010**.
111. Symposium on Functionalization of Tetrapyrroles, *6th International Conference on Porphyrins and Phthalocyanines*; Santa Ana Pueblo, NM; July 4-9, **2010**.
112. Symposium on Metalloporphyrin-Catalyzed Selective Organic Synthesis, *6th International Conference on Porphyrins and Phthalocyanines*; Santa Ana Pueblo, NM; July 4-9, **2010**.
113. *86th ACS Florida Section 83rd Annual Florida Meeting and Exposition (FAME 2010)*, Innisbrook, FL; May 13-15, **2010**.
114. Department of Chemistry, West Virginia University; Morgantown, WV; October 7, **2009**.
115. Department of Chemistry and Biochemistry, Miami University; Oxford, OH; September 24, **2009**.
116. *The 1st Chinese-American Chemistry & Chemical Biology Professors Association (CAPA) Annual Conference*, Hilton Head Island, SC; July 31-August 2, **2009**.
117. *The 5th Sino-US Symposium on Organic Chemistry*, Lanzhou University, Lanzhou, China; June 29-30, **2009**.
118. Department of Biology and Chemistry, City University of Hong Kong, Hong Kong, China; June 26, **2009**.
119. Department of Chemistry, University of Hong Kong, Hong Kong, China; June 25, **2009**.
120. Department of Applied Biology and Chemical Technology, Hong Kong Polytechnic University, Hong Kong, China; June 24, **2009**.
121. Department of Chemistry, Chinese University of Hong Kong, Hong Kong, China; June 24, **2009**.
122. School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou, China; June 23, **2009**.
123. Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China; June 19, **2009**.
124. Department of Catalysis Chemistry and Engineering, Dalian University of Technology, Dalian, China; June 19, **2009**.
125. *Catalysis Processes*, *5th International Conference on Porphyrins and Phthalocyanines*, Moscow, Russia; July 6-11, **2008**.
126. Department of Chemistry, Peking University, Beijing, China; January 4, **2008**.
127. Department of Chemistry, Tsinghua University, Beijing, China; January 4, **2008**.
128. Department of Chemistry, Beijing Normal University, Beijing, China; January 3, **2008**.
129. Institute of Chemistry, Chinese Academy of Sciences, Beijing, China; January 2, **2008**.
130. Department of Chemistry, Anhui Normal University, Wuhu, China; December 28, **2007**.
131. Department of Chemistry, Shanghai Jiaotong University, Shanghai, China; December 27, **2007**.

132. Department of Chemistry, Tongji University, Shanghai, China; December 26, **2007**.
133. Department of Chemistry, Fudan University, Shanghai, China; December 26, **2007**.
134. Department of Chemistry, East-China University of Science and Technology, Shanghai, China; December 25, **2007**.
135. Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, China; December 25, **2007**.
136. Department of Chemistry, Hamilton College, Clinton, NY; October 19, **2007**.
137. Drug Discovery Colloquium, Department of Chemistry, University of South Florida, Tampa, FL; October 16, **2007**.
138. ACS Florida Section 83rd Annual Florida Meeting and Exposition (FAME 2007), Orlando, FL; May 10-12, **2007**.
139. World Precision Instruments, Inc., Sarasota, FL; April 3, **2007**.
140. Department of Chemistry, Central Michigan University, Mt. Pleasant, MI; March 19, **2007**.
141. Symposium on Chiral Porphyrins for Self-Assembly and Catalysis, *4th International Conference on Porphyrins and Phthalocyanines*, Rome, Italy; July 2-7, **2006**.
142. *National Science Foundation Inorganic Chemistry Workshop*, Blaine, WA; June 6-9, **2006**.
143. Department of Chemistry, University of South Florida, Tampa, FL; March 10, **2006**.
144. Department of Chemistry, Georgia State University, Atlanta, GA; March 1, **2006**.
145. Department of Chemistry and Biochemistry, University of Texas at Arlington, Arlington, TX; February 3, **2006**.
146. Department of Chemistry, Texas Christian University, Fort Worth, TX; February 2, **2006**.
147. Department of Chemistry and Biochemistry, Texas Tech University, Lubbock, TX; February 1, **2006**.
148. Department of Chemistry, University of Georgia, Athens, GA; December 9, **2005**.
149. School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA; December 8, **2005**.
150. Department of Chemistry, Emory University, Atlanta, GA; December 7, **2005**.
151. Department of Chemistry and Biochemistry, University of California at San Diego, La Jolla, CA; December 2, **2005**.
152. Department of Chemistry, University of California at Irvine, Irvine, CA; December 1, **2005**.
153. Department of Chemistry, University of Southern California, Los Angeles, CA; November 29, **2005**.
154. Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA; November 28, **2005**.
155. Department of Chemistry, University of Akron, Akron, OH; November 22, **2005**.
156. Department of Chemistry, Case Western Reserve University, Cleveland, OH; November 21, **2005**.
157. Department of Chemistry, University of Kentucky, Lexington, KY; November 18, **2005**.
158. Department of Chemistry, Indiana University, Bloomington, IN; November 10, **2005**.
159. Department of Chemistry, Purdue University, West Lafayette, IN; November 8, **2005**.
160. Department of Chemistry, East Carolina University, Greenville, NC; October 28, **2005**.
161. Department of Chemistry and Biochemistry, Miami University, Oxford, OH; October 20, **2005**.

162. Department of Chemistry, Duke University, Durham, NC; October 18, **2005**.
163. Department of Chemistry, University of Tennessee at Chattanooga, Chattanooga, TN; October 14, **2005**.
164. Department of Chemistry, University of Alabama, Tuscaloosa, AL; October 6, **2005**.
165. Department of Chemistry, Georgia State University, Atlanta, GA; September 30, **2005**.
166. Department of Chemistry and Biochemistry, University of Delaware, Newark, DE; September 22, **2005**.
167. Department of Chemistry, University of Pennsylvania, Philadelphia, PA; September 20, **2005**.
168. Chemical Science Division, Oak Ridge National Laboratory, Oak Ridge, TN; September 15, **2005**.
169. Department of Chemistry, State University of New York at Buffalo, Buffalo, NY; September 7, **2005**.
170. Department of Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, VA; August 26, **2005**.
171. Department of Chemistry, Fudan University, Shanghai, China; August 4, **2005**.
172. Department of Chemistry, Shanghai Jiaotong University, Shanghai, China; August 3, **2005**.
173. Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, China; August 2, **2005**.
174. Department of Chemistry, Peking University, Beijing, China; July 27, **2005**.
175. Institute of Chemistry, Chinese Academy of Sciences, Beijing, China; July 26, **2005**.
176. Department of Chemistry, Beijing Normal University, Beijing, China; July 25, **2005**.
177. *Gordon Research Conference on Organometallic Chemistry*, New Port, RI, July 10-15, **2005**.
178. Department of Chemistry, University of Chicago, Chicago, IL; May 27, **2005**.
179. Department of Chemistry and Biochemistry, University of Mississippi, Oxford, MS; March 24, **2005**.
180. Department of Chemical Engineering, University of Tennessee, Knoxville, TN; October 26, **2004**.
181. Symposium on Organometallic and Materials Chemistry in the Southeast, *55th Southeast Regional Meeting of the American Chemical Society*, Atlanta, GA; November 16-19, **2003**.
182. Department of Chemistry, West Kentucky University, Bowling Green, KY; November 1, **2002**.
183. Department of Chemistry, University of West Florida, Pensacola, FL; February 8, **2002**.
184. Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, China; July 20, **2001**.
185. Department of Chemistry, Anhui Normal University, Wuhu, China; July 16, **2001**.
186. Department of Chemistry, Michigan State University, East Lansing, MI; January 18, **2001**.
187. Department of Chemistry, North Carolina State University, Raleigh, NC; January 16, **2001**.
188. Department of Chemistry, University of Tennessee, Knoxville, TN; January 12, **2001**.
189. Department of Chemistry and Biochemistry, Ohio University, Athens, OH, January 8, **2001**.

190. Department of Chemistry, New York University, New York, NY; January 4, **2001**.
191. Department of Chemistry, University of Rochester, Rochester, NY; December 11, **2000**.
192. Department of Chemistry, University of Toronto, Toronto, Canada; December 7, **2000**.
193. Department of Chemistry, University of Nevada, Reno, NV; December 4, **2000**.
194. School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA; November 30, **2000**.
195. Department of Chemistry, University of Hawaii, Honolulu, HI; November 20, **2000**.
196. Department of Chemistry, Boston University, Boston, MA; November 9, **2000**.
197. Department of Chemistry, Wayne State University, Detroit, MI; November 7, **2000**.
198. Department of Chemistry, University of Michigan, Ann Arbor, MI; October 30, **2000**.
199. Department of Chemistry and Biochemistry, University of Colorado, Boulder, CO; January 20, **1999**.
200. Department of Chemistry, University of Texas, Dallas, TX; November 25, **1998**.
201. Department of Chemistry, New York State University, Binghamton, NY, November 20, **1998**.
202. School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA, November 16, **1998**.