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CURRICULUM VITAE
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EDUCATION

Ph.D. 2002, Harvard University, Cambridge, Massachusetts (R. H. Holm, advisor)
A.M. 2000, Harvard University, Cambridge, Massachusetts (R. H. Holm, advisor)
B.S. *summa cum laude* 1996, Southern Methodist University, Dallas, Texas

EXPERIENCE

Case Western Reserve University. Associate Professor of Chemistry, with tenure, 2010-present.
Case Western Reserve University. Frank Hovorka Assistant Professor of Chemistry, 2007-2010.
Case Western Reserve University. Assistant Professor of Chemistry, 2004-2007.
Massachusetts Institute of Technology. Guest instructor, 5.04, Inorganic Chemistry II, Fall 2003.
Massachusetts Institute of Technology. Postdoctoral Fellow, Department of Chemistry, 2002-2004 (D. G. Nocera, advisor)
Harvard University. Teaching Fellow in Advanced Inorganic Chemistry, Fall 2001.
American Red Cross certification in C.P.R., 1997-2001, and first aid, 1997-2002.
Harvard University. Safety Officer of the Holm research group, 1997-2002.
Harvard University. Teaching Fellow in Inorganic Chemistry, Spring 1997.
Harvard University. Teaching Fellow in Advanced Inorganic Chemistry, Fall 1996.
Southern Methodist University. Undergraduate research participant, 1993-1996 (J. A. Maguire, advisor).
Southern Methodist University. Treasurer, SMU Chemistry Society, 1995-1996.
Southern Methodist University. Director of Grammar School Science Demonstrations, SMU Chemistry Society 1994-1996.

HONORS

Alfred P. Sloan Research Fellow, 2009-2011
National Institutes of Health Postdoctoral Fellow, 2002-2003
National Science Foundation Fellow, 1997-2000 (Harvard University)
Graduated first in class, Dedman College, Southern Methodist University, 1996

University Outstanding Scholar Award, 1996 (SMU)
John K. Godbey Outstanding Senior Scientist Award, 1996 (SMU)
Dr. Pepper/Lazenby Award for Excellence in Chemistry, 1996 (SMU)
Chemistry Department Citizenship Award, 1996 (SMU)
Alpha Tau Omega National Freshman Honor Society Award, 1996
Phi Beta Kappa, 1995-present (elected during the junior year)
Golden Key National Honor Society, 1995
Barry M. Goldwater Excellence in Education Fellowship, 1994-1996
Harold Jeskey Scholarship, 1993-1994; 1994-1995 (SMU)
Freshman Chemistry Award, 1993 (SMU)
Alpha Tau Omega National Freshman Honor Society, 1992-1996
University Scholar, 1992-1996 (SMU)
National Merit Scholar, 1992-1996

PEER-REVIEWED GRANTS

Current

A.C.S. Petroleum Research Fund Type ND, "Rational Synthesis of Iridium(III)-Alkane Complexes," $100,000. July 1, 2013–June 30, 2016.

Department of Energy, "Cyclometalation Syntheses of Phosphorescent Complexes," $450,000. August 15, 2013–August 14, 2016.

Completed

National Science Foundation, "Luminactive Gold Complexes: Synthesis and Photophysics," $396,000. April 1, 2011 – March 31, 2014.

National Science Foundation, "Novel Biophotonic Probes to Monitor Cellular Metabolism of Nucleosides," $591,999. July 15, 2011 – July 14, 2014.

National Science Foundation, "Luminactive Gold Complexes: Synthesis and Photophysics," $375,000. April 1, 2008 – March 31, 2011.

A.C.S. Petroleum Research Fund Type G, "Bridging Biology and Nanochemistry: Metalloclusters as Bioimaging Agents and Biomineralization Scaffolds," $35,000.00. September 1, 2006 – August 31, 2007.

PUBLICATIONS. An asterisk indicates that Gray is corresponding author.

1. "Structural Distortions in Main-Group Metallacarboranes," Maguire, J. A.; Hosmane, N. S.; Saxena, A. K.; Zhang, H.; **Gray, T. G.** *Phosphorus and Sulfur* **1994**, *87*, 129-137.

2. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 18. Synthetic, Spectroscopic, Reactivity, and Bonding Studies on the Group 13 Element Metallacarboranes: Crystal Structures of 1-(CMe_3)-1-Ga(2,2′-$C_{10}H_8N_2$)-2,3-($SiMe_3$)$_2$-2,3-$C_2B_4H_4$, 1-(CMe_3)-1-Ga(L)-2,4-($SiMe_3$)$_2$-2,4-$C_2B_4H_4$ [L = 2,2′-$C_{10}H_8N_2$, 2,2′-$C_8H_6N_4$], *closo*-1-(Me_2CH)-1-In-2,4-($SiMe_3$)$_2$-2,4-$C_2B_4H_4$, and 1-(Me_2CH)-1-In(2,2′-$C_{10}H_8N_2$)-2,4-($SiMe_3$)$_2$-$C_2B_4H_4$," Hosmane, N. S.; Saxena, A. K.; Lu, K.-J.; Maguire, J. A.; Zhang, H.; Wang, Y.; Thomas, C. J.; Zhu, D.; Grover, B.; **Gray, T. G.;** Eintracht, J. F. *Organometallics* **1995**, *14*, 5104-5118.

3. "Magnesium Alkyls as Metalating Reagents in the Formation of Novel Half- and Full-Sandwich Magnesacarboranes," Hosmane, N. S.; Zhu, D.; McDonald, J. E.; Zhang, H.; Maguire, J. A.; **Gray, T. G.;** Helfert, S. C. *J. Am. Chem. Soc.* **1995** *117*, 12362-12363.

4. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 20. Synthetic and Structural Studies of Sandwich Ln(III) Carborane Clusters. II (Ln(III) = Sm, Gd, Dy, Ho, Er)," Hosmane, N. S.; Wang, Y.; Zhang. H.; Maguire, J. A.; McInnis, M.; **Gray, T. G.;** Collins, J. D.; Kremer, R. K.; Binder, H.; Waldhör, E.; Kaim, W. *Organometallics* **1996**, *15*, 1006-1013.

5. "Electron-Acceptor Behavior of 1,4,7,9-Tetracarba-*nido*-dodecaborane(12) with Group 1 and Group 2 Metals: Syntheses and Crystal Structures of [($THF)_4Li$][($SiMe_3$)$_4C_4B_8H_9$ and [($THF)_2Mg$($SiMe_3$)$_4C_4B_8H_8$]," Hosmane, N. S.; Zhang. H.; Wang, Y.; Lu, K.-J.; Thomas, C. J.; Ezhova, M. B.; Helfert, S. C.; Collins, J. D.; Maguire, J. A.; **Gray, T. G.;** Baumann, F.; Kaim, W. *Organometallics* **1996**, *15*, 2425-2427.

6. "The First Carborane with a Distorted Cuboctahedral Structure," Hosmane, N. S.; Zhang, H.; Maguire, J. A.; Wang, Y.; Thomas, C. J.; **Gray, T. G.** *Angew. Chem., Int. Ed. Engl.* **1996**, *35*, 1000-1001; *Angew. Chem.* **1996**, *108*, 1093–1095.

7. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 21. Syntheses, Structures, EPR Spectra, and Reactivities of Bent-Sandwich and Half-Sandwich Titanacarboranes. Full Analysis of Spin–Spin Coupling in Two Structurally Characterized Titanium(III)–Carborane Dimers," Hosmane, N. S.; Wang, Y.; Zhang, H.; Lu, K.-J.; Maguire, J. A.; **Gray, T. G.;** Brooks, K. A.; Waldhör, E.; Kaim, W.; Kremer, R. K. *Organometallics* **1997**, *16*, 1365-1377.

8. "Thermal Conversion of *closo*-1,2-($SiMe_3$)$_2$-1,2-$C_2B_4H_4$ to *closo*-1,6-($SiMe_3$)$_2$-1,6-$C_2B_4H_4$: Structure Determination by Ab Initio Calculations, Gas-phase Electron Diffraction, and Low-Temperature X-ray Diffraction," Maguire, J. A.; Lu, K.-J.; Thomas, C. J.; **Gray, T. G.;** Wang, Y. Eintracht, J. F.; Hosmane, N. S.; Binder, H.; Wanitschek, M.; Borrmann, H.; Simon, A.; Oberhammer, H. *Chem. Eur. J.* **1997**, *3*, 1059-1063.

9. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 23. Synthetic, Structural, and Spectroscopic Investigation on Half- and Full-Sandwich Magnesacarboranes of 2,3- and 2,4-C_2B_4 Carborane Ligands," Hosmane, N. S.; Zhu, D.; MacDonald, J. E.; Zhang, H.; Maguire, J. A.; **Gray, T. G.;** Helfert, S. C. *Organometallics* **1998**, *17*, 1426–1437.

10. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 26. Further Investigation of the Oxidative Cage Closure, Cage Fusion, and Cage Isomerizations: Synthetic, Structural, and Bonding Studies on 'Carbons Adjacent' and 'Carbons Apart' Tetracarba-*nido*-dodecaborane(12) Derivatives," Hosmane, N. S.; Colacot, T. J.; Zhang, H.; Yang, J.; Maguire, J. A.; Wang, Y.; Ezhova, M. B.; Franken, A.; Demissie, T.; Lu, K.-J.; Zhu, D.; Thomas, J. L. C.; Collins, J. D.; **Gray, T. G.;** Hosmane, S. N.; Lipscomb, W. N. *Organometallics* **1998**, *17*, 5294-5309.

11. "Crystal structure of 4,4-dimethyloxazolidine-2-thione, C_5H_9NOS," **Gray, T.;** Laplaza, C. E.; Staples, R. J. *Z. Kristallogr.* **1999**, *214*(2), 230.

12. "Synthesis and Structures of Solvated Monoclusters and Bridged Di- and Triclusters Based on the Cubic Building Block $[Re_6(\mu_3\text{-}Se)_8]^{2+}$," Zheng, Z.; **Gray, T. G.;** Holm, R. H. *Inorg. Chem.* **1999**, *38*, 4888-4895.

13. "Highly Emissive Hexanuclear Rhenium(III) Clusters Containing the Cubic Cores $[Re_6S_8]^{2+}$ and $[Re_6Se_8]^{2+}$," **Gray, T. G.;** Rudzinski, C. M.; Nocera, D. G.; Holm, R. H. *Inorg. Chem.* **1999**, *38*, 5932-5933.

14. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 28. Selective Alkylation and Reactivity of "Carbons Adjacent" and "Carbons Apart" Tetracarba-*nido*-dodecaborane(12) Derivatives toward Group 1 and Group 2 Metals. Synthetic, Spectroscopic, and Structural Investigations on Lithium-, Sodium-, Potassium-, Cesium-, and Magnesium-Complexed C_4B_8 Carboranes," Hosmane, N. S.; Zhang, H.; Maguire, J. A.; Wang, Y.; Demissie, T.; Colacot, T. J.; Ezhova, M. B.; Lu, K.-J.; Zhu, D.; **Gray, T. G.;** Helfert, S. C.; Hosmane, S. N.; Collins, J. D.; Baumann, F.; Kaim, W.; Lipscomb, W. N. *Organometallics* **2000**, *19*, 497-508.

15. "Bridged Multiclusters Derived from the Face-Capped Octahedral $[Re_6^{III}(\mu_3\text{-}Se)_8]^{2+}$ Cluster Core," Selby, H. D.; Zheng, Z.; **Gray, T. G.;** Holm, R. H. *Inorg. Chim. Acta* **2001**, *312*, 205-209.

16. "Site-Differentiated Hexanuclear Rhenium(III) Cyanide Clusters $[Re_6Se_8(PEt_3)_n(CN)_{6-n}]^{n-4}$ (n = 4, 5) and Kinetics of Solvate Ligand Exchange on the Cubic $[Re_6Se_8]^{2+}$ Core," **Gray, T. G.;** Holm, R. H. *Inorg. Chem.* **2002**, *41*, 4211-4216.

17. "A Combined Experimental and Theoretical Investigation of Excited-State Attributes of Hexanuclear Rhenium Chalcogenide Clusters," **Gray, T. G.;** Rudzinski, C. M.; Meyer, E. E.; Holm, R. H.; Nocera, D. G. *J. Am. Chem. Soc.* **2003**, *125*, 4755-4770.

18. "Hexanuclear and Higher Nuclearity Clusters of the Groups 4–7 Metals with Stabilizing π-Donor Ligands," **Gray, T. G.** *Coord. Chem. Rev.* **2003**, *243*, 213-235.

19. "Synthesis, Structure, and CO_2-Reactivity of a Two-Coordinate (Carbene)copper(I)–Methyl Complex," Mankad, N.; **Gray, T. G.;** Laitar, D. S.; Sadighi, J. P. *Organometallics*, **2004**, *23*, 1191-1193.

20. "Excited-State Distortion of Rhenium(III) Sulfide and Selenide Clusters," **Gray, T. G.;** Rudzinski, C. M.; Meyer, E. E.; Nocera, D. G. *J. Phys. Chem. A* **2004**, *108*, 3238-3243.

21. "Cooperative Bimetallic Reactivity: Hydrogen Activation in Two-Electron Mixed-Valence Compounds," **Gray, T. G.;** Veige, A. S.; Nocera, D. G. *J. Am. Chem. Soc.* **2004**, *126*, 9670-9678.

22. "Hydrogenation of Two-Electron Mixed-Valence Iridium Alkyl Complexes," Veige, A. S.; **Gray, T. G.;** Nocera, D. G. *Inorg. Chem.* **2005**, *44*, 17-26.

23. "Heterobimetallic Main Group-Transition Metal Paddle-Wheel Carboxylates," Dikarev, E. V.; **Gray, T. G.;** Li, B. *Angew. Chem., Int. Ed.* **2005**, *44*, 1721-1724.

24. "Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 31. New Insights into Reaction Pathways of Carborane Ligand Systems: Synthetic, Structural, Spectroscopic, and Electrochemical Studies on Sandwich and Half-Sandwich Metallacarboranes of Iron, Cobalt, and Nickel," Tomlinson, S.; Zheng, C.; Hosmane, N. S.; Yang, J.; Wang, Y.; Zhang, H.; **Gray, T. G.;** Demissie, T.; Maguire, J. A.; Baumann, F.; Klein, A.; Sarker, B.; Kaim, W.; Lipscomb, W. N. *Organometallics* **2005**, *24*, 2177-2187.

25. "A model for two-electron mixed valence in metal-metal bonded dirhodium compounds," **Gray, T. G.;** Nocera, D. G. *Chem. Commun.* **2005**, 1540-1542.

26. "Oxygen and hydrogen photocatalysis by two-electron mixed-valence coordination compounds," Rosenthal, J.; Bachman, J.; Dempsey, J. L.; Esswein, A. J.; **Gray, T. G.;** Hodgkiss, J. M.; Manke, D. R.; Luckett, T. D.; Pistorio, B. J.; Veige, A. S.; Nocera, D. G. *Coord. Chem. Rev.* **2005**, *249*, 1316-1326.

*27. "A Carbene-Stabilized Gold(I) Fluoride: Synthesis and Theory," Laitar, D. S.; Müller, P.; **Gray, T. G.;** Sadighi, J. P. *Organometallics* **2005**, *24*, 4503–4505.

*28. "Carbon-Gold Bond Formation through [3 + 2] Cycloaddition Reactions of Gold(I) Azides and Terminal Alkynes," Partyka, D. V.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; Gold(I) Triazolyls: Organometallic Synthesis in Air and Aqueous Media *Organometallics* **2007**, *26*, 183–186.

*29. "Relativistic Functional Groups: Aryl Carbon-Gold Bond Formation by Selective Transmetallation of Boronic Acids," Partyka, D. V.; Zeller, M.; Hunter, A. G.; **Gray, T. G.** *Angew. Chem., Int. Ed.* **2006**, *45*, 8188–8191; *Angew. Chem.* **2006**, *118*, 8368–8371.

*30. "Bis(tetraphenylphosphonium) Octa(μ_3-chloro)hexakis(trifluoromethanesulfonato) octahedrohexamolybdate (2–) Dichloromethane/diethyletherate," Peay, M.; Updegraff, J. III; **Gray, T. G.** *Acta Cryst. E* **2006**, *62*, m2895–m2897.

*31. "Gold(I) Pyrenyls: Excited-State Consequences of Carbon-Gold Bond Formation," Partyka, D. V.; Esswein, A. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2007**, *26*, 3279–3282.

*32. "Luminescent, Three-Coordinate Azadipyrromethene Complexes of d^{10} Copper, Silver, and Gold," Teets, T. S.; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Inorg. Chem.* **2007**, *46*, 6218–6220.

*33. "Gilded Organometallics," **Gray, T. G.** *Comments Inorg. Chem.* **2007**, *28*, 181–212 **(invited review article).** DOI: 10.1080/02603590701849025

*34. "Dialkylbiarylphosphine complexes of Gold(I) Halides. Gold-aryl π-Interactions in the Solid State," Partyka, D. V.; Robilotto, T. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2008**, *27*, 28–32.

*35. "Homoleptic, Four-Coordinate Azadipyrromethene Complexes of d^{10} Zinc and Mercury," Teets, T. S.; Partyka, D. V.; Updegraff, J. B. III; **Gray, T. G.** *Inorg. Chem.* **2008**, *47*, 2338–2346.

*36. "A Convergent Approach to the Synthesis of Multimetallic Dithiolene Complexes," Arumugam, K.; Yu, R.; Villágran, D.; **Gray, T. G.;** Mague, J. T.; Donahue, J. P. *Inorg. Chem.* **2008**, *47*, 5570–5572.

*37. "A Porphyrin Complex of Gold(I): (Phosphine)gold(I) Azides as Cation Precursors," Partyka, D. V.; Robilotto, T. J.; Zeller, M.; Hunter, A. D.; Gray, T. G. *Proc. Natl. Acad. Sci., U.S.A.* **2008**, *105*, 14293–14297. DOI: 10.1073/pnas.0806520105

38. "Facile Synthesis of Homoleptic Dialkylmercurials via Transmetallation of Arylboronic Acids," Partyka, D. V.; Gray, T. G. *J. Organomet. Chem.* **2009**, *694*, 213–218. DOI: 10.1016/j.jorganchem.2008.10.024

*39. "Facile Synthesis of (Phosphine-) and (*N*-heterocyclic Carbene)Gold(I) and Silver(I) Azide Complexes," Partyka, D. V.; Robilotto, T. J.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2009**, *28*, 795–801.

*40. "Divergent Electronic Structures of Isoelectronic Metalloclusters: Tungsten(II) Halides and Rhenium(III) Chalcogenide-Halides," **Gray, T. G.** *Chem. Eur. J.* **2009**, *15*, 2581–2593. DOI: 10.1002/chem.200800152

*41. "Probing the Steric Limits of Carbon-Gold Bond Formation: (Dialkylbiarylphosphine)gold(I) Aryls," Partyka, D. V.; Updegraff, J. B. III; Zeller, M.;

Hunter, A. D.; **Gray, T. G.** *Organometallics* **2009**, *28*, 1666–1674. DOI: 10.1021/om800746u

*42. "Synthesis, Crystal Structures, and Luminescence of New Alkynylgold(I) Complexes," Gao, L.; Partyka, D. V.; Updegraff, J. B. III; Deligonul, N.; **Gray, T. G.** *Eur. J. Inorg. Chem.* **2009**, 2711–2719. DOI: 10.1002/ejic.200900307

43. "Unusual Phosphorus-phosphorus Double Bond Contraction Upon Mono- and Di-Auration of a Diphosphene," Partyka, D. V.; Washington, M. P.; **Gray, T. G.;** Updegraff, J. B. III; Turner, J. F., II; Protasiewicz, J. D. *J. Am. Chem. Soc.* **2009**, *131*, 10041–10048. DOI: 10.1021/ja900813v

*44. "Three-Coordinate, Phosphine-Ligated Azadipyrromethene Complexes of Univalent Group 11 Metals," Teets, T. S.; Updegraff, J. B.; Esswein, A. J.; **Gray, T. G.** *Inorg. Chem.* **2009**, *48*, 8134–8144. DOI: 10.1021/ic900208a

*45. "Mono- and Di-Gold(I) Naphthalenes and Pyrenes: Synthesis, Crystal Structures, and Photophysics," Gao, L.; Peay, M. A.; Partyka, D. V.; Updegraff, J. B. III; Teets, T. S.; Esswein, A. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2009**, *28*, 5669–5681. DOI: 10.1021/om9005214

*46. "*fac*-Tricarbonyl Rhenium(I) Azadipyrromethene Complexes," Partyka, D. V.; Deligonul, N.; Washington, M. P.; **Gray, T. G.** *Organometallics* **2009**, *28*, 5837–5840. DOI: 10.1021/om900552e

*47. "Synthesis, Structures and Properties of 1,2,4,5-Benzenetetrathiolate Linked Group 10 Metal Complexes," Arumugam, K.; Chandrasekaran, P.; Villagrán, D.; **Gray, T. G.;** Mague, J. T.; Donahue, J. P. *Inorg. Chem.* **2009** *48*, 10591–10607. DOI: 10.1021/ic901257s

*48. "Copper-Catalyzed Huisgen [3 + 2] Cycloaddition of Gold(I) Alkynyls with Benzyl Azide. Syntheses, Structures, and Optical Properties," Partyka, D. V.; Gao, L.; Teets, T. S.; Updegraff, J. B. III; Deligonul, N.; Gray, T. G. *Organometallics* **2009**, *28*, 6171–6182. DOI: 10.1021/om9005774

49. "Catalytic Aerobic Oxidation of PPh_3 by a Trianionic Pincer $Cr^{III}/Cr^{V}O$ Couple," O'Reilly, M.; Falkowski, J. M.; Ramachandran, V.; Pati, M.; Abboud, K. A.; Dalal, N. S.; **Gray, T. G.**; Veige, A. S. *Inorg. Chem*. **2009**, *48*, 10901–10903. DOI: 10.1021/ic9019469

*50. "Excited-State Dynamics of (Organophosphine)gold(I) Pyrene Isomers," Vogt, R. A.; Peay, M. A.; **Gray, T. G.;** Crespo-Hernández, C. E. *J. Phys. Chem. Lett.* **2010**, *1*, 1205–1211. DOI: 10.1021/jz100052m

*51. "Gold(I) Halide Complexes of Bis(diphenylphosphine)diphenyl Ether Ligands: A Balance of Ligand Strain and Non-Covalent Interactions," Partyka, D. V.; Updegraff, J. B. III;

Zeller, M.; Hunter, A. D.; **Gray, T. G.,** *Dalton Trans.* **2010**, *39*, 5388–5397. DOI: 10.1039/B920717A

*52. "Encapsulation of Phosphine-Terminated Rhenium(III) Chalcogenide Clusters in Silica Nanoparticles," Gao, L.; Peay, M. A.; **Gray, T. G.** *Chem. Mater.* **2010**, *22*, 6240–6245. DOI: 10.1021/cm101609p

*53. "Cytotoxic gold(I)-bearing dendrimers from alkyne precursors," Robilotto, T. J.; Alt, D. S.; von Recum, H. A.; **Gray, T. G.** *Dalton Trans.* **2011**, *40*, 8083–8085. DOI: 10.1039/C1DT10578G

*54. "Red-Shifts upon Metal Binding: a Di-Gold(I)-Substituted Bithiophene," Peay, M. A.; Heckler, J. E.; Deligonul, N.; **Gray, T. G.** *Organometallics,* **2011**, *30*, 5071–5074. DOI: 10.1021/om2003267

*55. "Gold-Containing Indoles as Anticancer Agents that Potentiate the Cytotoxic Effects of Ionizing Radiation," Craig, S.; Gao, L.; Lee, I.; **Gray, T.;** Berdis, A. J. *J. Med. Chem.* **2012**, *55*, 2437–3451. DOI: 10.1021/jm2005942

*56. "Constrained Di-Gold(I) Diaryls: Syntheses, Crystal Structures, and Photophysics," Partyka, D. V.; Teets, T. S.; Zeller, M.; Updegraff, J. B., III; Hunter, A. D.; **Gray, T. G.** *Chem. Eur. J.* **2012**, *18*, 2100–2112. DOI: 10.1002/chem.201101891

*57. "Gold(I) Styrylbenzene, Distyrylbenzene, and Distyrylnaphthalene Complexes: High Emission Quantum Yields at Room Temperature," Gao, L.; Niedzwiecki, D. S.; Deligonul, N.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Chem. Eur. J.* **2012**, *18*, 6316–6327. DOI: 10.1002/chem.201102502

*58. "Geminally Diaurated Gold(I) Aryls from Boronic Acids," Heckler, J. E.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Angew. Chem., Int. Ed.* **2012**, *51*, 5924–5928. DOI: 10.1002/anie.201201744

*59. "Gold(I) Complexes of Brominated Azadipyrromethene Ligands," Gao, L.; Deligonul, N.; **Gray, T. G.** *Inorg. Chem.* **2012**, *51*, 7682–7688. DOI: 10.1021/ic300709n

*60. "Arylgold(I) Complexes from Base-Assisted Transmetallation: Structures, NMR Properties, and Density-Functional Theory Calculations," Partyka, D. V.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Inorg. Chem.* **2012**, *51*, 8394–8401. DOI: 10.1021/ic3009464

*61. "Sub-Picosecond Intersystem Crossing in Mono- and Di(organophosphine)gold(I) Naphthalene Derivatives in Solution," Vogt, R. A.; **Gray, T. G.;** Crespo-Hernández, C. E. *J. Am. Chem. Soc.* **2012**, *134*, 14808–14817. DOI: 10.1021/ja303592q

*62. "Synthesis of a Trigold Monocation: An Isolobal Analogue of $[H_3]^+$," Robilotto, T. J.; Bacsa, J.; **Gray, T. G.;** Sadighi, J. P., *Angew. Chem., Int. Ed.* **2012**, *51*, 12077-12080.

DOI: 10.1002/anie.201206712; *Angew. Chem.* **2012**, *124*, 12243-12246. DOI: 10.1002/ange.201206712

63. "Rapid Synthesis of Arylgold Compounds Using Dielectric Heating," Lenker, H. K.; **Gray, T. G.;** Stockland, R. A., Jr., *Dalton Trans.* **2012**, *41*, 13274–13276. DOI: 10.1039/C2DT32129G

*64. "Room-Temperature Synthesis of Cyclometalated Iridium(III) Complexes: Kinetic Isomers and Reactive Functionalities," Maity, A.; Anderson, B. L.; Deligonul, N.; **Gray, T. G.** *Chem. Sci.* **2013**, *4*, 1175–1181. DOI: 10.1039/c2sc21831c

*65. "Gold(I) Triazolyls: Organometallic Synthesis in Air and Aqueous Media" Heckler, J.E.; Deligonul, N.; Rheingold, A.L.; **Gray, T.G.** *Chem. Commun.* **2013**, *49*, 5990–5992. DOI: 10.1039/C3CC43016B

*66. "Azido, Triazolyl, and Alkynyl Complexes of Gold(I): Syntheses, Structures, and Ligand Effects," Robilotto, T.J.; Deligonul, N.; Updegraff, J.B., III; Gray, T.G. *Inorg. Chem.* **2013**, *52*, 9659–9668. DOI: 10.1021/ic4014569.

*67. "Cyclometalated Iridium(III) Complexes with Deoxyribose Substituents," Maity, A.; Teets, T. S.; Deligonul, N.; Berdis, A. J.; **Gray, T. G.,** *Chem. Eur. J.* **2012**, *19*, 15924–15932. DOI: 10.1002/chem.201301776

*68. "Bonding and Reactivity of a μ-Hydrido Dicopper Cation," Wyss, C. M.; Tate, B. K.; Bacsa, J.; **Gray, T. G.;** Sadighi, J. P. *Angew. Chem., Int. Ed.* **2013**, *52*, 12920–12923. DOI: 10.1002/anie.201306736

*69. "Azadipyrromethene Complexes of d^8 Metal Centers: Rhodium(I), Iridium(I), Palladium(II), and Platinum(II)," Deligonul, N.; **Gray, T. G.** *Inorg. Chem.* **2013**, *52*, 13048–13057. DOI: 10.1021/ic4017239

*70. "Cyclometalated Iridium(III) Complexes of Azadipyrromethene Chromophores," Deligonul, N.; Golen, J. A.; Rheingold, A. L.; **Gray, T. G.** *Organometallics*, **2014**, *33*, 637–643. DOI: 10.1021/om4007032

*71. "Geminally Diaurated Aryls Bridged by Semirigid Phosphine Pillars: Syntheses and Electronic Structure," Browne, A. R.; Deligonul, N.; Anderson, B. L.; Rheingold, A. L.; Gray, T. G. *Chem. Eur. J.* **2014**, *20*, 17552–17564. DOI: 10.1002/chem.201403444

*72. "Suzuki-Miyaura Coupling of Arylboronic Acids to Gold(III)," Maity, A.; Deligonul, N.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Chem. Sci.* **2015**, *6*, 981–986. DOI: 10.1039/c4sc02148g

73. "A Metal-Containing Nucleoside that Possesses Both Therapeutic and Diagnostic Activity Against Cancer," Choi, J. S.; Maity, A.; **Gray, T. G.;** Berdis, A. J. *J. Biol. Chem.* **2015**, *290*, 9714-9726. DOI: 10.1074/jbc.M114.620294)

*74. "Fluoride Complexes of Cyclometalated Iridium(III)," Maity, A.; Stanek, R. J.; Anderson, B. L.; Zeller, M.; Hunter, A. D.; Moore, C. E.; Rheingold, A. L.; Gray, T. G. *Organometallics* **2015**, *34*, 109–120. DOI: 10.1021/om5009555

*75. "Cyclometalated (boroxinato)gold(III) complexes from arrested transmetalation," Browne, A. R.; Deligonul, N.; Anderson, B. L.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Chem. Commun.* **2015**, *51*, 15800-15803. DOI: 10.1039/C5CC05200A

*76. Wyss, C. M.; Bitting, J.; Bacsa, J.; **Gray, T. G.;** Sadighi, J. P. Bonding and Reactivity of a Dicopper(I) μ-Boryl Cation. *Organometallics* DOI: 10.1021/acs.organomet.5b00961

*77. "Cyclometalated Gold(III) Trioxadiborrin Complexes: Studies of the Bonding and Excited States," Ayoub, N. A.; Browne, A. R. Anderson, B. L.; **Gray, T. G.** ***Submitted for publication.***

BOOK CHAPTER

Gray, T. G.; Sadighi, J. P. "Group 11 metal–metal bonds." Invited contribution to *Molecular Metal-Metal Bonds. Compounds, Synthesis, Properties*, Stephen Liddle (Ed.), Wiley, 2015.

CONFERENCE PRESENTATIONS

1. "Metallacarboranes of Lanthanides," Wang, Y.; Oki, A. R.; Zhang, H.; **Gray, T. G.;** Maguire, J. A.; Hosmane, N. S. *Abstr. Pap. Am. Chem. Soc.* 209: 162-INOR Part 1 April 2, 1995.

2. "Controlled Aggregation and Electrochemistry of Hexanuclear Rhenium Clusters," **Gray, T. G.;** Zheng, Z.; Holm, R. H. *Abstr. Pap. Am. Chem. Soc.* 216: 467-INOR August 25, 1998.

3. "Excited-State Attributes of Hexanuclear Rhenium(III) Chalcogenide Clusters," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 224: 303-INOR August 20, 2002.

4. "Triplet-State Structure of Emitting Rhenium(III) Chalcogenide Clusters," **Gray, T. G.;** Nocera, D. G.; Rudzinski, C. M. Inorganic Chemistry Gordon Research Conference; July 13–18, 2003.

5. "Heterobimetallic Bismuth-Transition Metal Carboxylates," Li, B.; **Gray, T. G.;** Dikarev, E. V. *Abstr. Pap. Am. Chem. Soc.* 228: INOR-431 August 22–26, 2004.

6. "Carbon-Gold Bond Formation," **Gray, T. G.;** Partyka, D. V. Organometallic Chemistry Gordon Research Conference; July 9–14, 2006.

7. "Gilded Organometallics," **Gray, T. G.;** Partyka, D. V. Metals in Biology Gordon Research Conference; January 28–February 1, 2007.

8. "Relativistic Protons: Carbon-Gold Bond Formation," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 233: INOR-555 March 25–29, 2007.

9. "Metallocomplexes of Photoactive Ligands for Photodynamic Therapy," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 233: INOR-768 March 25–29, 2007.

10. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.** National Science Foundation Workshop in Inorganic Chemistry, June 4–7, 2007.

11. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.**; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B., III; Gao, L.; Robilotto, T. J.; Peay, M. A. Organometallic Chemistry Gordon Research Conference; July 6–8, 2007.

12. "Metalla-azadipyrromethenes: Synthesis and Optical Properties," **Gray, T. G.**; Teets, T. S.; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B., III Organometallic Chemistry Gordon Research Conference; July 6–8, 2007.

13. "Gold-Plated Fluorophores," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 234: INOR-800 August 19–23, 2007.

14. "Synthesis and Study of Multimetallic Complexes with Dithiolene, Bis(phosphine), and Diimine Connecting Ligands," Arumugam, K.; Chandrasekaran, P.; Shaw, M. C.; **Gray, T. G.;** Mague, J. T.; Donahue, J. P. *Abstr. Pap. Am. Chem. Soc.* 235: INOR-171 April 6–10, 2008.

15. "Gilded Organometallics: Synthesis and Excited-State Properties," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 235: INOR-508 April 6–10, 2008.

16. "Synthesis of Multimetallic Mixed Dithiolene-phosphine Complexes,"Donahue, J. P.; Arumugam, K.; Yu, R.; **Gray, T. G.;** Villágran, D.; Mague, J. T. *Abstr. Pap. Am. Chem. Soc.* 235: INOR-900 April 6–10, 2008.

17. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.;** Partyka, D. V.; Teets, T. S.; Updegraff, J. B. III; Gao, L.; Robolitto, T. J.; Peay, M. A. Inorganic Chemistry Gordon Research Conference; July 13–17, 2008.

18. "Cycloaddition Reactions of Gold(I) Complexes," **Gray, T. G.;** Partyka, D. V.; Robolitto, T. J.; Updegraff, J. B. III. Inorganic Chemistry Gordon Research Conference; July 13–17, 2008.

19. "Gilded Organometallics: Synthesis and Excited-State Properties," **Gray, T. G.;** Partyka, D. V.; Teets, T. S.; Peay, M. A.; Robolitto, T. J.; Gao, L. *Abstr. Pap. Am. Chem. Soc.* 236: INOR-389 August 17–21, 2008.

20. "Biomedical Applications of Gold Containing Nucleosides: Development of a Dual Imaging and Therapeutic Agent," Craig, S.; Motea, E.; Lee, I.; **Gray, T. G.;** Berdis, A. J., 21st Enzyme Mechanisms Conference Loews Ventana Canyon Resort Tucson, Arizona, January 3–6, 2009.

21. "Gold Adducts of Diphosphenes, Phospha-Wittig Reagents, and Phosphines ," Partyka, D. V.; **Gray, T. G.;** Washington, M. P.; Updegraff, J. B.; Chen, X.; Incarvito, C. D.; Rheingold, A. D.; Protasiewicz, J. D. *Abstr. Pap. Am. Chem. Soc.* 237: INOR-431 March 22–26, 2009.

22. "Gilded Organometallics." **Gray, T. G.** CERMACS, Central Regional Meeting of the American Chemical Society, May 21, 2009.

23. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.;** Partyka, D. V.; Gao, L.; Teets, T. S.; Robolitto, T. J.; Peay, M. A. Organometallic Chemistry Gordon Research Conference, July 12-17, 2009.

24. "Metalla-Azadipyrromethenes: Synthesis and Optical Properties," **Gray, T. G.;** Teets, T. S.; Partyka, D. V.; Deligonul, N. Organometallic Chemistry Gordon Research Conference, July 12-17, 2009.

25. "Copper-catalyzed Gold(I) Click Chemistry," Gao, L.; Partyka, D. V.; **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 238: INOR-862 August 16-20, 2009.

26. "Synthesis of a new series of phosphine gold(I) triazole dendrimers with a fluorescent marker," Robilotto, T. J.; Alt, D. S.; von Recum, H. A; **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 238: INOR-871 August 16-20, 2009.

27. "Gilded Organometallics: Recent Developments," **Gray, T. G.;** Partyka, D. V.; Gao, L.; Robilotto, T. J.; Deligonul, N. *Abstr. Pap. Am. Chem. Soc.* 240: INOR-581 August 22-26, 2010.

28. "Gilded Organometallics: Recent Developments in Synthesis and Photophysics,"**Gray, T. G.;** Partyka, D. V.; Gao, L.; Robilotto, T. J.; Deligonul, N. *Abstr. Pap. Am. Chem. Soc.* 241: INOR-403 March 27-31, 2011. **Invited presentation in honor of Alan Balch.**

29. "Gilded Organometallics," **Gray, T. G.** CANBIC III: Third Georgian Bay International Conference on Bioinorganic Chemistry, June 3, 2011. **Invited presentation.**

30. "Bioactive Gold(I) Organometallics," **Gray, T. G.,** Gao, L.; Craig, S.; Lee, I.; Berdis, A. J. Metals in Biology Gordon Research Conference, January 22–27, 2012.

31. "Geminally Diaurated Arenes: Synthetic, Structural, and Theoretical Studies," Heckler, J. E.; **Gray, T. G.** Organometallic Chemistry Gordon Research Conference, July 7–12, 2013.

32. "Room-Temperature Synthesis of Cyclometalated Iridium(III) Complexes: Kinetic Isomers and Reactive Functionalities," Maity, A.; **Gray, T. G.** Organometallic Chemistry Gordon Research Conference, July 7–12, 2013.

33. "Metal-Carbon Bonds from Boron Transmetalation," **Gray, T. G.;** Browne, A. R.; Deligonul, N.; Heckler, J. E.; Maity, A. *Abstr. Pap. Am. Chem. Soc.* 246: INOR-69 September 8–12, 2013.

34. "Geminally Diaurated Arenes: Syntheses, Crystal Structures, and DFT Studies," Heckler, J. E.; Zeller, M.; **Gray, T. G.** A. *Abstr. Pap. Am. Chem. Soc.* 246: INOR-411 September 8–12, 2013.

35. "Room-Temperature Synthesis of Cyclometalated Iridium(III) Complexes: Kinetic Isomers and Reactive Functionalities," Maity, A.; Anderson, B. L.; Deligonul, N.; **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 246: INOR-417 September 8–12, 2013.

INVITED SEMINARS

1. "Ground- and Excited-State Attributes of Hexanuclear Rhenium(III) Chalcogenide Clusters." Condensed Matter Physics Seminar, Department of Physics, Case Western Reserve University, September 9, 2005. Professor Harsh Mathur, host.

2. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry and Biochemistry, Northern Illinois University, October 17, 2005. Professor Narayan S. Hosmane, host.

3. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry, John Carroll University, October 19, 2005. Professor David P. Mascotti, host.

4. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry, Cleveland State University, November 4, 2005. Professor Stan Duraj, host.

5. "R-Rated [Aurated] Organometallic Compounds." Department of Chemistry, University of Akron. Professor Christopher Ziegler, host. October 1, 2006.

6. "R-Rated [Aurated] Organometallic Compounds." Department of Chemistry, Penn State Erie, the Behrend College. Professor Michael Justik, host. December 11, 2006.

7. "Gilded Organometallics." Department of Chemistry, The Ohio State University. Professor Claudia Turró, host. February 22, 2008.

8. "Gilded Organometallics." Department of Chemistry, Texas Christian University. Professor Robert Neilson, host. February 28, 2008.

9. "Gilded Organometallics." Department of Chemistry, Southern Methodist University. Professor John A. Maguire, host. February 29, 2008.

10. "R-Rated and X-rated Organometallics." Department of Chemistry, Illinois State University. Professor Lisa Szczepura, host. March 7, 2008.

11. "Gilded Organometallics." Department of Chemistry, Tulane University. Professor James P. Dohanue, host. April 28, 2008.

12. "Gilded Organometallics." Department of Chemistry, Louisiana State University. Professor George Stanley, host. April 30, 2008.

13. "Gilded Organometallics." Department of Chemistry, Purdue University. Professor Tong Ren, host. October 7, 2008.

14. "Gilded Organometallics." Department of Chemistry, Carnegie Mellon University. Professor Catalina Achim, host. February 26, 2009.

15. "Organogold Chemistry While Recognizing That All That Glisters is Not Gold." Department of Chemistry, The University of Florida. Professor Adam Veige, host. April 6, 2009.

16. "Gilded Organometallics." Department of Chemistry, Emory University. Professor Karl Hagen, host. April 7, 2009.

17. "Gilded Organometallics." Department of Chemistry and Biochemistry. Georgia Institute of Technology. Professor Jake Soper, host. April 8, 2009.

18. "Gilded Organometallics." Department of Chemistry, The University of Texas at El Paso. Professor Keith Pannell, host. April 15, 2009.

19. "Gilded Organometallics." Department of Chemistry and Biochemistry, New Mexico State University. Professor Jeremy Smith, host. April 16, 2009.

20. "Gilded Organometallics." Department of Chemistry, University of Michigan. Professor Bart Bartlett, host. May 19, 2009.

21. "Gilded Organometallics." Department of Chemistry, Case Western Reserve University. Professor Mary Barkley, host. August 27, 2009.

22. "Gilded Organometallics." Department of Chemistry, Bowling Green State University. Professor Felix Castellano, host. October 28, 2009.

23. "Gilded Organometallics." Department of Chemistry, The University of California, Berkeley. Professor Christopher J. Chang, host. November 20, 2009.

24. "Gilded Organometallics." Department of Chemistry, Bucknell University. Professor Robert Stockland, Jr., host. September 21, 2011.

25. "Gilded and Other Organometallics." Department of Chemistry, University of North Texas. Professor Mohammed Omary, host. October 12, 2012.

26. "Gilded Organometallics." Department of Chemistry, the University of Houston. Professor Olafs Daugulis, host. November 8, 2012.

27. "Adventures in Metal-Carbon Bond Formation." Department of Chemistry and Biochemistry, the University of Arizona. Professor Katrina Miranda, host. January 21, 2014.

28. "Cyclometalation Syntheses of Phosphorescent Complexes." U.S. Department of Energy Materials Chemistry P.I. Meeting. July 15, 2014.

RESEARCH COLLABORATIONS

Professor Joseph P. Sadighi, Georgia Institute of Technology. Density-functional theory calculations on organometallic compounds of the coinage metals. Initiated by Sadighi.

Professor Hingping Xiao, Case Western Reserve University. Low-temperature emission measurements on cyclometalates. Initiated by Gray.

RESEARCH PERSONNEL

- **Graduate Students**

Current

Ms. Amberle Browne	January 2010–present
Ms. Amanda Sulicz	January 2013–present
Mr. Robert Stanek	January 2014–present
Mr. Frank Youmbi	December 2015–present

Previous

Dr. James Updegraff	January 2005–April 2009
Dr. Lei Gao	January 2006–May 2010
Dr. Thomas Robilotto	March 2005–August 2010
Dr. Miya Peay	January 2005–May 2011
Ms. Kiera A. Knappman	July–August 2005 (GAANN summer rotation)
Mr. Alden Voelker	June 2008–August 2008 (summer rotation)
Dr. Nihal Deligonul	January 2009–June 2013
Ms. Xiaoxuan Dai (M.S.)	August 2012–August 2013

Dr. Ayan Maity	January 2009–August 2014
Dr. James Heckler	January 2010–July 2015
Ms. Yijuan (Nina) Hong (M. S.)	September 2014–May 2015
Mr. Yixiao Li (M. S.)	September 2014–May 2015
Mr. Yut-Tha-Na La-Kliang (M. S.)	October 2014–May 2015

- **Undergraduates.** All are or were Case Western Reserve students.

Mr. Jeremy Winkler ('06)	January–May 2006
Mr. Thomas S. Teets ('07)	January 2005–May 2007
Ms. Jenna Vergotz ('07)	January 2005– May 2007
Mr. Karolis Grigas ('09)	September 2004–October 2006; January–May 2007.
Mr. Daniel Alt ('09)	June 2008–May 2009
Mr. Daniel Niedzwiecki ('10)	January 2009–May 2010
Mr. Peter Zak ('12)	January 2011–December 2012
Mr. Xingchen Huang ('14)	August 2013–August 2014
Mr. Nicholas Ayoub ('19)	June 2015–present

- **Postdoctoral Research Associate**

  Dr. David V. Partyka (Ph.D. Harvard University, 2005)

TEACHING

Massachusetts Institute of Technology

Fall term, 2003	5.04, Inorganic Chemistry II (Group Theory) Guest Instructor, five lectures

Case Western Reserve University

Fall term, 2004	Chemistry 331, Laboratory Methods in Inorganic Chemistry
Spring term, 2005	Pre-tenure teaching release Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2005	Chemistry 331, Laboratory Methods in Inorganic Chemistry Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Spring term, 2006	Chemistry 502, Special Topics in Inorganic Chemistry (Bioinorganic) Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2006	Chemistry 412, Advanced Inorganic Chemistry Chemistry 507, Special Readings in Chemistry

	Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Spring term, 2007	Chemistry 502, Special Topics in Inorganic Chemistry (Bioinorganic) Chemistry 508, Special Readings in Chemistry Chemistry 397, Undergraduate Research Chemistry 398, SAGES Capstone Ancillary: Chemistry 234, Introductory Organic Chemistry Laboratory II
Fall term, 2007	Chemistry 412, Advanced Inorganic Chemistry Ancillary: Chemistry 290, Chemistry Laboratory Methods for Engineers (Lectured for three weeks and implemented one multisession experiment)
Spring term, 2008	Chemistry 502, Special Topics in Inorganic Chemistry (Bioinorganic) Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2008	Chemistry 412, Advanced Inorganic Chemistry Ancillary: Chemistry 290, Chemistry Laboratory Methods for Engineers
Spring term, 2009	Chemistry 502, Special Topics in Inorganic Chemistry (Bioinorganic) Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2009:	Chemistry 412, Advanced Inorganic Chemistry Chemistry 397, Undergraduate Research Ancillary: Chemistry 304, Quantitative Analytical Chemistry
Spring term, 2010	Chemistry 502, Special Topics in Inorganic Chemistry (Bioinorganic) Chemistry 508, Special Readings Chemistry 397, Undergraduate Research Ancillary: Chemistry 305, Physical Chemistry Laboratory
Fall term, 2010	Chemistry 311, Inorganic Chemistry I Chemistry 507, Special Readings Chemistry 397, Undergraduate Research Ancillary: Chair, Graduate Affairs Committee
Spring term, 2011	Chemistry 339/439, Bioinorganic Chemistry Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2011	Chemistry 311, Inorganic Chemistry I Chemistry 397, Undergraduate Research Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Spring term, 2012	Chemistry 502/504/506, Special Topics (Computational Chemistry)

	Chemistry 397, Undergraduate Research Chemistry 508, Special Readings Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2012	Chemistry 311, Inorganic Chemistry I Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Spring term, 2013	Chemistry 339/439, Bioinorganic Chemistry Ancillary: Chemistry 113, Principles of Chemistry Laboratory
Fall term, 2013	Chemistry 412, Advanced Inorganic Chemistry Chemistry 508, Special Readings Chemistry 397, Undergraduate Research Ancillary: Chemistry 233, Introductory Organic Chemistry Laboratory I
Spring term, 2014	Chemistry 342/442, Computational Chemistry Chemistry 508, Special Readings Chemistry 397, Undergraduate Research Ancillary: Chemistry 234, Introductory Organic Chemistry Laboratory II
Fall term, 2014	Chemistry 412, Advanced Inorganic Chemistry Chemistry 508, Special Readings Chemistry 397, Undergraduate Research Ancillary: Chemistry 233, Introductory Organic Chemistry Laboratory I
Spring term, 2015	Chemistry 342/442, Computational Chemistry Chemistry 316/416, Frontiers in Inorganic Chemistry (20% responsibility; eight lectures and a quiz in Bioinorganic Chemistry)
Fall term, 2015	Chemistry 412, Advanced Inorganic Chemistry Ancillary: Chemistry 331, Laboratory Methods in Inorganic Chemistry
Spring term, 2016	Chemistry 342/442, Computational Chemistry Chemistry 316/416, Frontiers in Inorganic Chemistry (20% responsibility; eight lectures and a quiz in Bioinorganic Chemistry) Chemistry 397, Undergraduate Research

SERVICE TO THE DEPARTMENT OF CHEMISTRY AND THE UNIVERSITY

Certified in CPR and basic life support for health providers, November 21, 2014.
CWRU Community Emergency Response Team (C.E.R.T.), September 2014–present.
Department of Chemistry Graduate Studies Committee, August 2015–present.
Department of Chemistry Graduate Affairs Committee, August 2009–2014; Chair, Fall 2010.
Department of Chemistry Visibility Committee, September 2008–2011.
Department of Chemistry Resources Committee, September 2011–present.
Department of Chemistry Graduate Recruiting Committee, September 2004–May 2009.
Department of Chemistry Executive Committee, September 2004–May 2006.
Case Western Reserve University Laboratory Safety Committee, September 2005–present.

AD HOC REVIEW ACTIVITIES

Department of Energy, 2013, 2015, 2016
National Science Foundation, 2007–2009, 2011, 2013, 2014
Journal of the American Chemical Society, 2005, 2007–2015
Inorganic Chemistry, 2005–2016
Crystal Growth and Design, 2006
Chemical Communications, 2007
Dalton Transactions, 2009
Journal of Chemical Physics, 2007
New Journal of Chemistry, 2007
Organometallics, 2008–2015
Chemistry—A European Journal, 2008
Chemistry—An Asian Journal, 2009
Bielstein Journal of Organic Chemistry, 2011
European Journal of Inorganic Chemistry, 2011, 2013
Angewandte Chemie, 2011, 2013–2015
Chemical Science, 2011, 2012, 2014, 2015
Advanced Synthesis and Catalysis, 2012
Journal of Materials Chemistry, 2012
Tetrahedron, 2015