

## Matthew D. Liptak

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### EDUCATION

- Ph.D. **University of Wisconsin-Madison** (Madison, WI) 2008  
**Major:** Physical Chemistry  
**Advisor:** Professor Thomas C. Brunold
- B.A. **Hamilton College** (Clinton, NY) 2003  
**Major:** Chemistry  
**Minor:** Physics  
**Advisor:** Professor George C. Shields

### PROFESSIONAL AND RESEARCH EXPERIENCE

- Professor of Chemistry** 2022 – current  
**University of Vermont** (Burlington, VT)
- Biochemistry B.S. Program Director** 2021 – current  
**University of Vermont** (Burlington, VT)
- Associate Professor of Chemistry** 2018 – 2022  
**University of Vermont** (Burlington, VT)
- Chemistry Ph.D. and M.S. Program Coordinator** 2017 – 2021  
**University of Vermont** (Burlington, VT)
- Assistant Professor of Chemistry** 2011 – 2018  
**University of Vermont** (Burlington, VT)
- NIH NRSA Postdoctoral Research Fellow** 2008 – 2011  
**University of Rochester** (Rochester, NY)  
**Research Advisor:** Professor Kara L. Bren  
**Grant Title:** *NMR and DFT Investigation of Porphyrin Conformation in Cytochromes c*
- Graduate Research Assistant** 2003 – 2008  
**University of Wisconsin-Madison** (Madison, WI)  
**Research Advisor:** Professor Thomas C. Brunold  
**Thesis:** *Spectroscopic and Computational Insights into the Cofactor Activation Mechanism of Cobalamin-dependent Methionine Synthase*

**Undergraduate Research Assistant**

2000 – 2003

**Hamilton College** (Clinton, NY)**Research Advisor:** Professor George C. Shields**Thesis:** *Modeling the Inhibition of Cdc25B: Incorporating QM/MM into Rational Drug Design***RESEARCH ACTIVITIES****Publications**

39. Petrucci, A.N.; Cousins, M.E.; **Liptak, M.D.** “Beyond ‘mega’: origin of the ‘giga’ Stokes shift of triazolopyridiniums” *J. Phys. Chem.* **2022**, *126*, 6997-7005.
38. Morris, J.A.; Lickey, B.; **Liptak, M.D.** “Insertion of cobalt into tetrapyrroles” *Vitam. Horm.* **2022**, *119*, 1-22.
37. Schuelke-Sanchez, A.E.; Cornetta, A.R.; Kocian, T.A.J.; Conger, M.A.; **Liptak, M.D.** “Ruffling is essential for *Staphylococcus aureus* IsdG-catalyzed degradation of heme to staphylobilin” *J. Biol. Inorg. Chem.* **2022**, *230*, 111775.
36. Roy, M.D.; Trenerry, M.J.; Thakuri, B.; MacMillan, S.N.; **Liptak, M.D.**; Lancaster, K.M.; Berry, J.F. “Electronic structure of Ru<sub>2</sub><sup>6+</sup> complexes with electron-rich anilinopyridinate ligands” *Inorg. Chem.* **2022**, *61*, 3443-3457.
35. Novas, B.T.; Morris, J.A.; **Liptak, M.D.**; Waterman, R. “Effect of photolysis on zirconium amino phenoxides for the hydrophosphination of alkenes: improving catalysis” *Photochem* **2022**, *2*, 77-87.
34. Jenny, K.A.; Ruggles, E.L.; **Liptak, M.D.**; Masterson, D.S.; Hondal, R.J. “Ergothioneine in a peptide: substitution of histidine with 2-thiohistidine in bioactive peptides” *J. Pept. Sci.* **2021**, *28*, e3339.
33. Thakuri, B.; O’Rourke, B.D.; Graves, A.B.; **Liptak, M.D.** “A dynamic substrate is required for MhuD-catalyzed degradation of heme to mycobilin” *Biochemistry*, **2021**, *60*, 918-928.
32. Schuelke-Sanchez, A.E.; Stone, A.A.; **Liptak, M.D.** “CfbA promotes insertion of cobalt into ruffled tetrapyrroles” *Dalton Trans.*, **2020**, *49*, 1065-1076.
31. Conger, M.A.; Cornetta, A.R.; **Liptak, M.D.** “Spectroscopic evidence for electronic control of heme hydroxylation by IsdG” *Inorg. Chem.*, **2019**, *58*, 15455-15465.
30. Shao, B.; Stankewitz, N.; Morris, J.A.; **Liptak, M.D.**; Aprahamian, I. “White-light emission from a structurally simple hydrazone” *Chem. Comm.*, **2019**, *55*, 9551-9554.
29. Wu, K.; Conger, M.A.; Waterman, R.; **Liptak, M.**; Geiger, W.E. “Electrochemical and structural characterization of a radical cation formed by one-electron oxidation of a cymantrene complex containing an N-heterocyclic carbene ligand” *Polyhedron*, **2019**, *157*, 442-448.

28. Thakuri, B.; Graves, A.B.; Chao, A.; Johansen, S.L.; Goulding, C.W.; **Liptak, M.D.** “The affinity of MhuD for heme is consistent with a heme degrading function *in vivo*” *Metallomics*, **2018**, *10*, 1560-1563.
27. Bange, C.A.; Conger, M.A.; Novas, B.T.; Young, E.R.; **Liptak, M.D.**; Waterman, R. “Light-driven, Zirconium-catalyzed Hydrophosphination with Primary Phosphines” *ACS Catal.*, **2018**, *8*, 6230-6238.
26. Anathy, V.; Lahue, K.G.; Chapman, D.G.; Chia, S.B.; Casey, D.T.; Aboushousha, R.; van der Velden, J.L.J.; Elko, E.; Hoffman, S.M.; McMillan, D.H.; Jones, J.T.; Nolin, J.D.; Abdalla, S.; Schneider, R.; Seward, D.; Roberson, E.C.; **Liptak, M.D.**; Cousins, M.E.; Butnor, K.J.; Taatjes, D.J.; Budd, R.C.; Irvin, C.G.; Ho, Y-S.; Hakem, R.; Brown, K.K.; Matsui, R.; Bachschmid, M.M.; Gomez, J.L.; Kaminski, N.; van der Vliet, A.; Janssen-Heininger, Y.M.W. “Reducing Protein Oxidation Reverses Lung Fibrosis” *Nat. Med.*, **2018**, *24*, 1128-1135.
25. Conger, M.A.; Pokhrel, D.; **Liptak, M.D.** “Tight binding of heme to *Staphylococcus aureus* IsdG and IsdI precludes design of a competitive inhibitor” *Metallomics*, **2017**, *9*, 556-563.  
\**Metallomics 2017 Most Downloaded Articles Collection*\*
24. Qian, H.; Cousins, M.E.; Horak, E.H.; Wakefield, A.; **Liptak, M.D.**; Aprahamian, I. “Suppression of Kasha’s Rule (SOKR): A Novel Mechanism to Explain Aggregation Induced Emission” *Nat. Chem.* **2017**, *9*, 83-87.
23. Graves, A.B.; Horak, E.H.; **Liptak, M.D.** “Dynamic Ruffling Distortion of the Heme Substrate in Non-Canonical Heme Oxygenase Enzymes” *Dalton Trans.* **2016**, *45*, 10058-10067.  
\**New Talent: Americas Collection*\*
22. Graves, A.B.; Graves, M.T.; **Liptak, M.D.** “Measurement of Heme Ruffling Changes in MhuD Using UV/Vis Spectroscopy” *J. Phys. Chem. B* **2016**, *120*, 3844-3853.
21. Lockhart, C.L.; Conger, M.A.; Pittman, D.S.; **Liptak, M.D.** “Hydrogen bond donation to the heme distal ligand of *Staphylococcus aureus* IsdG tunes the electronic structure” *J. Biol. Inorg. Chem.* **2015**, *20*, 757-770.
20. Graves, A.B.; Morse, R.P.; Chao, A.; Iniguez, A.; Goulding, C.W.; **Liptak, M.D.** “Crystallographic and Spectroscopic Insights into Heme Degradation by *Mycobacterium tuberculosis* MhuD” *Inorg. Chem.* **2014**, *53*, 5931-5940.
19. Owens, C.P.; Chim, N.; Graves, A.B.; Harmston, C.A.; Contreras, H.; Iniguez, A.; **Liptak, M.D.**; Goulding, C.W. “The *Mycobacterium tuberculosis* Secreted Protein, Rv0203, Transfers Heme to Membrane Proteins, Mycobacterial membrane protein Large 3 (MmpL3) and MmpL11” *J. Biol. Chem.* **2013**, *288*, 21714-21728.
18. Su, X.; **Liptak, M.D.**; Aprahamian, I. “Water-soluble Triazolopyridiniums as Tunable Blue Light Emitters” *Chem. Commun.* **2013**, *49*, 4160-4162.

**Supervised Career**

17. Josephs, T.M.; **Liptak, M.D.**; Hughes, G.; Lo, A.; Smith, R.M.; Wilbanks, S.M.; Bren, K.L.; Ledgerwood, E.C. "Conformational change and human cytochrome *c* function: mutation of residue 41 modulates caspase activation and destabilizes Met-80 coordination" *J. Biol. Inorg. Chem.* **2013**, *18*, 289-297.
16. **Liptak, M.D.**; Fagerlund, R.D.; Ledgerwood, E.C.; Wilbanks, S.M.; Bren, K.L. "The Proapoptotic G41S Mutation to Human Cytochrome *c* Alters the Heme Electronic Structure and Increases the Electron Self-exchange Rate" *J. Am. Chem. Soc.* **2011**, *133*, 1153-1155.
15. **Liptak, M.D.**; Wen, X.; Bren, K.L. "NMR and DFT Investigation of Heme Ruffling: Functional Implications for Cytochrome *c*" *J. Am. Chem. Soc.* **2010**, *132*, 9753-9763.
14. **Liptak, M.D.**; Fleischhacker, A.S.; Matthews, R.G.; Telser, J.; Brunold, T.C. "Spectroscopic and Computational Characterization of the Base-off Forms of Cob(II)alamin" *J. Phys. Chem. B.* **2009**, *113*, 5245-5254.
13. **Liptak, M.D.**; Van Heuvelen, K.M.; Brunold, T.C. "Computational Studies of Bioorganometallic Enzymes and Cofactors", in Volume 6 of *Metal Ions In Life Sciences* (Sigel, A.; Sigel, H.; Sigel, R.K.O. Eds.), Royal Society of Chemistry, Cambridge, U.K., **2009**, 417-460.
12. Brunold, T.C.; Conrad, K.S.; **Liptak, M.D.**; Park, K. "Spectroscopically-validated Density Functional Theory Studies of the B<sub>12</sub> Cofactors and their Interactions with Enzyme Active Sites", *Coord. Chem. Rev.* **2008**, *253*, 779-794.
11. **Liptak, M.D.**; Datta, S.; Matthews, R.G.; Brunold, T.C. "Spectroscopic Study of the Cobalamin-dependent Methionine Synthase in the Activation Conformation: Effects of the Y1139 Residue and *S*-adenosylmethionine on the B<sub>12</sub> Cofactor" *J. Am. Chem. Soc.* **2008**, *130*, 16374-16381.
10. **Liptak, M.D.**; Fleischhacker, A.S.; Matthews, R.G.; Brunold, T.C. "Probing the Role of the Histidine 759 Ligand in Cobalamin-dependent Methionine Synthase" *Biochemistry* **2007**, *46*, 8024-8035.
9. **Liptak, M.D.**; Brunold, T.C. "Spectroscopic and Computational Studies of Co<sup>1+</sup>Cobalamin: Spectral and Electronic Properties of the "Superreduced" B<sub>12</sub> Cofactor" *J. Am. Chem. Soc.* **2006**, *128*, 9144-9156.
8. Pickard, F.C.; Griffith, D.R.; Ferrara, S.J.; **Liptak, M.D.**; Kirschner, K.N.; Shields, G.C. "CCSD(T), W1, and Other Model Chemistry Predictions for Gas-phase Deprotonation Reactions" *Int. J. Quantum Chem.* **2006**, *106*, 3122-3128.
7. **Liptak, M.D.**; Shields, G.C. "Comparison of Density Functional Theory Predictions of Gas-phase Deprotonation Data" *Int. J. Quantum Chem.* **2005**, *105*, 580-587.
6. Pickard, F.C.; Pokon, E.K.; **Liptak, M.D.**; Shields, G.C. "Comparison of CBS-QB3, CBS-APNO, G2, and G3 Thermochemical Predictions with Experiment for Formation of Ionic

- Clusters of Hydronium and Hydroxide Ions Complexed with Water” *J. Chem. Phys.* **2005**, *122*, 024302.
5. **Liptak, M.D.**; Gross, K.C.; Seybold, P.G.; Feldgus, S.; Shields, G.C. “Absolute pK<sub>a</sub> Determinations for Substituted Phenols” *J. Am. Chem. Soc.* **2002**, *124*, 6421-6427.
  4. Pokon, E.K.; **Liptak, M.D.**; Feldgus, S.; Shields, G.C. “Comparison of CBS-QB3, CBS-APNO, and G3 Predictions of Gas Phase Deprotonation Data” *J. Phys. Chem. A.* **2001**, *105*, 10483-10487.
  3. **Liptak, M.D.**; Shields, G.C. “Experimentation with Different Thermodynamic Cycles Used for pK<sub>a</sub> Calculations on Carboxylic Acids Using Complete Basis Set and Gaussian-*n* Models Combined with CPCM Continuum Solvation Methods” *Int. J. Quantum Chem.* **2001**, *85*, 727-741.
  2. **Liptak, M.D.**; Shields, G.C. “Accurate pK<sub>a</sub> Calculations for Carboxylic Acids Using Complete Basis Set and Gaussian-*n* Models Combined with CPCM Continuum Solvation Methods” *J. Am. Chem. Soc.* **2001**, *123*, 7314-7319.
  1. Toth, A.M.; **Liptak, M.D.**; Phillips, D.L.; Shields, G.C. “Accurate Relative pK<sub>a</sub> Calculations for Carboxylic Acids Using Complete Basis Set and Gaussian-*n* Models Combined with Continuum Solvation Methods” *J. Chem. Phys.* **2001**, *114*, 4595-4606.

### Conference Presentations

36. Morris, J.A.; **Liptak, M.D.** “The origin of metal selectivity for class II chelatases involved in metal tetrapyrrole biosynthesis” *Gordon Research Conference: Metals in Biology*, **2023**, Ventura, CA.
35. **Liptak, M.D.** “Non-canonical Heme Oxygenase Products: Revisited” *Gordon Research Conference: Tetrapyrroles*, **2022**, Newport, RI (Invited Talk).
34. Thakuri, B.T.; Schuelke-Sanchez, A.E.; Cornetta, A.R.; Kocian, T.A.J.; **Liptak, M.D.** “Product distributions for non-canonical heme oxygenases depend upon enzyme-induced heme ruffling” *Gordon Research Conference: Metallocofactors*, **2022**, Newport, RI.
33. Conger, M.A.; Grover, A.; **Liptak, M.D.** “Characterization of a Ferryl-oxoheme form of *Staphylococcus aureus* IsdG” *Gordon Research Conference: Metals in Biology*, **2020**, Ventura, CA.
32. **Liptak, M.D.** “Spectroscopic Evidence for Electronic Control of Heme Hydroxylation by *Staphylococcus aureus* IsdG” *CanBIC-7*, **2019**, Parry Sound, ON (Invited Talk).
31. Conger, M.A.; Cornetta, A.R.; **Liptak, M.D.** “Spectroscopic evidence for electronic control of heme hydroxylation by IsdG” *Gordon Research Conference: Metals in Biology*, **2019**, Ventura, CA.
30. **Liptak, M.D.** “Spectroscopic Evidence for Electronic Control of Heme Hydroxylation by *Staphylococcus aureus* IsdG” *256<sup>th</sup> ACS National Meeting*, **2018**, Boston, MA (Contributed Talk).

29. **Liptak, M.D.** “Spectroscopic Evidence for Electronic Control of Heme Hydroxylation by IrdG” *Gordon Research Conference: Tetrapyrroles*, **2018**, Newport, RI (Selected Talk).
28. **Liptak, M.D.**; Conger, M.A.; Thakuri, B. “Heme Binding to Non-Canonical Heme Oxygenases Measured Using Fluorescence” *Gordon Research Conference: Metals in Biology*, **2018**, Ventura, CA.
27. **Liptak, M.D.**; Conger, M.A.; Graves, A.B. “Non-Canonical Heme Oxygenases: A New Chapter of Heme–Oxygen Chemistry” *CanBIC-6*, **2017**, Parry Sound, ON (Invited Talk).
26. **Liptak, M.D.** “Nuclear Magnetic Spectroscopic Elucidation of MhuD Mechanism” *253<sup>rd</sup> ACS National Meeting*, **2017**, San Francisco, CA (Invited Talk).
25. Conger, M.A.; Graves, A.B.; Pokhrel, D.; Horak, E.H.; **Liptak, M.D.** “Two Substrate Conformations are Required for Non-Canonical Heme Oxygenase Activity” *Gordon Research Conference: Metals in Biology*, **2017**, Ventura, CA.
24. **Liptak, M.D.** “Quantum Mechanical Origins of Hydrazone-Based Emission” *Advanced Next Generation Energy Leadership (ANGEL) Symposium 2016*, Burlington, VT (Invited Talk).
23. **Liptak, M.D.** “Non-Canonical Heme Oxygenases: A New Chapter of Heme–Oxygen Chemistry” *Gordon Research Conference: Tetrapyrroles*, **2016**, Newport, RI (Invited Talk).
22. Graves, A.B.; **Liptak, M.D.** “Thermally-Accessible Electronic States of Cyanide-Inhibited Ferric Heme” *Gordon Research Conference: Metals in Biology*, **2016**, Ventura, CA.
21. **Liptak, M.D.**, Horak, E.H. “Insight Into Hydrazone-Based Dye Fluorescence from Density Functional Theory” *249<sup>th</sup> ACS National Meeting*, **2015**, Denver, CO (Invited Talk).
20. **Liptak, M.D.**, Graves, A.B., Lockhart, C.L. “Second-Sphere Tuning of Enzymatic Activity in Non-Canonical Heme Oxygenases” *249<sup>th</sup> ACS National Meeting*, **2015**, Denver, CO (Contributed Talk).
19. **Liptak, M.D.**, Graves, A.B.; Lockhart, A.B. “Saltman Lecture: Second-Sphere Tuning of Enzymatic Activity in Non-Canonical Heme Oxygenases” *Gordon Research Conference: Metals in Biology*, **2015**, Ventura, CA (Invited Talk).
18. **Liptak, M.D.**, Graves, A.B.; Lockhart, A.B. “Second-Sphere Contributions to the Electronic Structure and Reactivity of Heme Degrading Enzymes” *Gordon Research Conference: Tetrapyrroles*, **2014**, Newport, RI.
17. **Liptak, M.D.** “Heme Iron Acquisition by Pathogenic Organisms: Functional Insights from Spectroscopy and Theory” *Gordon Research Conference: Metals in Biology*, **2014**, Ventura, CA.
16. **Liptak, M.D.** “Heme Iron Acquisition by *Mycobacterium tuberculosis*: Insights from Spectroscopy in Magnetic Fields” *32<sup>nd</sup> Boston Regional Inorganic Colloquium*, **2013**, Boston, MA (Invited Talk).

15. **Liptak, M.D.**; Roffman, A.B.; Lockhart, C.L. “NMR and MCD Investigation of Heme Oxygenases from Pathogenic Bacteria” *Gordon Research Conference: Metals in Biology*, **2012**, Ventura, CA.

### ***Supervised Career***

14. **Liptak, M.D.**; Fagerlund, R.D.; Ledgerwood, E.C.; Wilbanks, S.M.; Bren, K.L. “Electronic Changes in Cytochromes *c* with Functional Consequences” *240<sup>th</sup> ACS National Meeting*, **2010**, Boston, MA.
13. **Liptak, M.D.**; Bren, K.L. “Paramagnetic NMR and DFT Investigation of Heme Ruffling: Implications for Reduction Potential Tuning in Cytochromes *c*” *Gordon Research Conference: Metals in Biology*, **2010**, Ventura, CA.
12. **Liptak, M.D.**; Bren, K.L. “DFT-Aided Interpretation of NMR Hyperfine Shifts: Application to Ruffling in Cytochrome *c*” *11<sup>th</sup> Upstate New York NMR Symposium*, **2009**, Buffalo, NY.
11. **Liptak, M.D.**; Bowman, S.J.; Bren, K.L. “NMR and DFT Investigation of Heme Conformation in Cytochrome *c*” *236<sup>th</sup> ACS National Meeting*, **2009**, Washington, D.C.
10. **Liptak, M.D.**; Datta, S.; Matthews, R.G.; Brunold, T.C. “Spectroscopic Study of Cobalamin-Dependent Methionine Synthase in the Activation Conformation: Roles of the H759 and Y1139 Residues” *Gordon Research Seminar: Bioinorganic Chemistry*, **2008**, Ventura, CA.
9. **Liptak, M.D.**; Fleishhacker, A.S.; Datta, S.; Matthews, R.G.; Brunold, T.C. “A Combined Spectroscopic and Computational Approach to Investigate the Electronic Structures of Corrinoids: Application to Cobalamin-dependent Methionine Synthase” *Gordon Research Conference: Vitamin B<sub>12</sub> and Corphins*, **2007**, Biddeford, ME.
8. **Liptak, M.D.**; Fleishhacker, A.S.; Datta, S.; Matthews, R.G.; Brunold, T.C. “Spectroscopic Insights into the Mechanism of Cobalamin-dependent Methionine Synthase” *Gordon Research Seminar: Bioinorganic Chemistry*, **2007**, Ventura, CA.
7. **Liptak, M.D.**; Fleishhacker, A.S.; Matthews, R.G.; Brunold, T.C. “Combined Spectroscopic and Computational Investigation of the Reactivation Cycle of Cobalamin-Dependent Methionine Synthase” *12<sup>th</sup> International Conference on Bioinorganic Chemistry*, **2005**, Ann Arbor, MI.
6. **Liptak, M.D.**; Shields, G.C. “Modeling the Inhibition of Cdc25B with QM/MM” *43<sup>rd</sup> Sanibel Symposium*, **2003**, St. Augustine, FL.
5. **Liptak, M.D.**; Feldgus, S.; Shields, G.C. “Absolute pK<sub>a</sub> Determinations for Protonated Nitrogen Compounds” *Pfizer Summer Undergraduate Research Fellowship Program*, **2002**, Groton, CT.
4. **Liptak, M.D.** “Absolute pK<sub>a</sub> Determinations for Substituted Phenols” *47<sup>th</sup> Annual Undergraduate Research Symposium: Rochester Section of the ACS*, **2002**, Geneva, NY.
3. **Liptak, M.D.**; Feldgus, S.; Shields, G.C. “Absolute pK<sub>a</sub> Determination for Protonated Nitrogen Compounds” *1<sup>st</sup> MERCURY Conference in Computational Chemistry*, **2002**, Clinton, NY.

2. **Liptak, M.D.**; Gross, K.C.; Seybold, P.G.; Feldgus, S.; Shields, G.C. “Absolute pK<sub>a</sub> Determinations for Substituted Phenols” *42<sup>nd</sup> Sanibel Symposium*, **2002**, St. Augustine, FL.

1. **Liptak, M.D.** “Accurate pK<sub>a</sub> Calculations” *41<sup>st</sup> Sanibel Symposium*, **2001**, St. Augustine, FL.

### Invited Lectures

SUNY-Potsdam	November 5, 2019
St. Michael’s College	February 15, 2019
University of New Mexico	October 8, 2018
Hamilton College	September 29, 2017
University of Massachusetts	April 27, 2017
University of Wisconsin	March 1, 2017
University of Utah	October 11, 2016
University of Rochester	September 26, 2016
Kansas University	April 22, 2016
Middlebury College	October 2, 2015
Dartmouth College	April 17, 2014
Syracuse University	October 15, 2013
University of Vermont (Department of Physics)	October 10, 2013
University of Vermont (Department of Immunology)	January 31, 2013
University of New England	September 28, 2012
University of Vermont (Department of Biochemistry)	April 27, 2012
Penn State-Erie	November 1, 2011
University of Minnesota	January 18, 2011
Wayne State University	January 10, 2011
University of Vermont	January 6, 2011
University of Iowa	December 9, 2010
Hamilton College	May 2, 2009

### Financial Support

#### Current Support

**Proposal Title:** Heme oxygenases: chemically complex enzymes found in diverse biological pathways

**Source of support:** National Institutes of Health

**Project Role:** PI

**Direct Support:** \$927,083

**Total Award Amount:** \$1,389,462

**Total Award Period Covered:** 03/01/2021 – 02/28/2026

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 2 summer months

**Proposal Title:** Metal Tetrapyrrole Biosynthesis: inserting the correct metal

**Source of support:** National Science Foundation

**Project Role:** PI

**Direct Support:** \$269,909

**Total Award Amount:** \$399,000

**Total Award Period Covered:** 08/15/2020 – 07/31/2023

**Project Location:** University of Vermont



**Person-months per year to be devoted to the project:** 1 summer month

**Completed Support**

**Proposal Title:** MRI: Acquisition of an EPR Spectrometer at the University of Vermont

**Source of support:** National Science Foundation

**Project Role:** Co-PI

**Direct Support:** \$343,800

**Total Award Amount:** \$343,800

**Total Award Period Covered:** 09/01/2019 – 08/31/2022

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 0 months

**Proposal Title:** Administrative Supplement for Second-Sphere Influences on Oxygen Activation by Non-Canonical Heme Oxygenases

**Source of support:** National Institutes of Health

**Project Role:** PI

**Direct Support:** \$174,710

**Total Award Amount:** \$174,710

**Total Award Period Covered:** 08/01/2019 – 07/31/2022

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 0 months

**Proposal Title:** Second-Sphere Influences on Oxygen Activation by Non-Canonical Heme Oxygenases

**Source of support:** National Institutes of Health

**Project Role:** PI

**Direct Support:** \$892,500

**Total Award Amount:** \$1,320,978

**Total Award Period Covered:** 09/01/2016 – 07/31/2022

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 2 summer months

**Proposal Title:** Spectroscopy-Guided Metalloprotein Design Aided by Electronic Structure Calculations

**Source of support:** University of Vermont

**Project Role:** PI

**Direct Support:** \$639,000

**Total Award Amount:** \$639,000

**Total Award Period Covered:** 09/01/2011 – 12/14/2018

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 0 months

**Proposal Title:** Collaborative Research: Hydrazone-Based Solid-State Light Emitters

**Source of support:** National Science Foundation

**Project Role:** PI

**Direct Support:** \$150,626

**Total Award Amount:** \$212,380

**Total Award Period Covered:** 08/01/2015 – 07/31/2018

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 1 summer month

**Proposal Title:** Pilot Study of Two Putative Metal-binding Proteins from *Clostridium difficile*

**Source of support:** University of Vermont

**Project Role:** PI

**Direct Support:** \$12,500

**Total Award Amount:** \$25,000

**Total Award Period Covered:** 02/28/2014 – 06/30/2016

**Project Location:** University of Vermont

**Person-months per year to be devoted to the project:** 0 months

**Proposal Title:** NMR and DFT Investigation of Porphyrin Conformation in Cytochromes *c*

**Source of Support:** National Institutes of Health

**Project Role:** PI

**Direct Support:** \$84,370

**Total Award Amount:** \$103,995

**Total Award Period Covered:** 06/01/2009 – 07/31/2011

**Project Location:** University of Rochester

**Person-months per year to be devoted to the project:** 12 months

### Collaborators

Prof. Ivan Aprahamian, Dartmouth

Prof. John Berry, Wisconsin

Prof. Liz Boon, SUNY-Stony Brook

Prof. Celia W. Goulding, UC-Irvine

Prof. Kevin Kittilstved, UMass-Amherst

Prof. William Lanzilotta, Georgia

Prof. Steven Mansoorabadi, Auburn

Prof. Mario Rivera, Kansas

Prof. Aimee Shen, Tufts

Prof. Eric P. Skaar, Vanderbilt

Hydrazone Fluorophores

Diruthenium complexes

*S. oneidensis* NosP

*M. tuberculosis* MhuD, MmpL

EPR Spectroscopy

*E. coli* ChuW

*M. acetivorans* CfbA

*S. aureus* IsdG

*C. difficile* CotA, SipL

*S. aureus* IsdG, IsdI

### Affiliations

American Chemical Society

Phi Beta Kappa

Sigma Xi

### Honors and Awards

NIGMS MIRA Award 2021

New Talent: Americas 2016

Paul Saltman Award 2015

Ruth Kirschstein-NRSA 2009

Vilas Travel Grant 2007

M<sup>c</sup>Elvain Travel Grant 2006

Runner-up for NSF Graduate Research Fellowship 2003

Pfizer Undergraduate Summer Research Fellowship 2002

Barry M. Goldwater Scholarship 2002

Merck/AAAS Undergraduate Summer Research Fellowship

2000

## TEACHING ACTIVITIES

### Teaching Experience

#### Professor of Chemistry

**University of Vermont** (Burlington, VT)

CHEM 166: Physical Chemistry Lab	Spring 2023
CHEM 182: 2 <sup>nd</sup> Year Seminar: Presentation	Spring 2023
CHEM 181: 2 <sup>nd</sup> Year Seminar: Writing	Fall 2022
CHEM 231: Advanced Inorganic Chemistry	Fall 2022

#### Associate Professor of Chemistry

**University of Vermont** (Burlington, VT)

CHEM 236: Physical Inorganic Chemistry	Spring 2022
CHEM 031: General Chemistry I	Fall 2021
CHEM 318: Current Topics in Chemistry	Fall 2021
CHEM 484: Advanced Topics in Chemistry	Summer 2021
CHEM 231: Advanced Inorganic Chemistry	Fall 2020
CHEM 318: Current Topics in Chemistry	Fall 2020
CHEM 484: Advanced Topics in Chemistry	Summer 2020
CHEM 131: Inorganic Chemistry	Spring 2020
CHEM 231: Advanced Inorganic Chemistry	Fall 2019
CHEM 199: Professional Development	Spring 2019
CHEM 236: Physical Inorganic Chemistry	Spring 2019
CHEM 199: Professional Development	Fall 2018
CHEM 231: Advanced Inorganic Chemistry	Fall 2018

#### Assistant Professor of Chemistry

**University of Vermont** (Burlington, VT)

CHEM 131: Inorganic Chemistry	Spring 2018
CHEM 318: Current Topics in Chemistry	Spring 2018
CHEM 231: Advanced Inorganic Chemistry	Fall 2017
CHEM 318: Current Topics in Chemistry	Fall 2017
CHEM 031: General Chemistry I	Spring 2017
CHEM 231: Advanced Inorganic Chemistry	Fall 2016
CHEM 236: Physical Inorganic Chemistry	Spring 2016
CHEM 031: General Chemistry I	Fall 2015
CHEM 231: Advanced Inorganic Chemistry	Fall 2014
CHEM 318: Current Topics in Chemistry	Fall 2014
CHEM 040: Introduction to Research	Spring 2014
CHEM 236: Physical Inorganic Chemistry	Spring 2014
CHEM 231: Advanced Inorganic Chemistry	Fall 2013
CHEM 231: Advanced Inorganic Chemistry	Fall 2012
CHEM 040: Introduction to Research	Spring 2012
CHEM 236: Physical Inorganic Chemistry	Spring 2012
CHEM 318: Current Topics in Chemistry	Spring 2012
CHEM 380: Chemical Investigations	Spring 2012

CHEM 231: Advanced Inorganic Chemistry

Fall 2011

**Teaching Assistant****University of Rochester** (Rochester, NY)

CHM 414: Bioinorganic Chemistry

Spring 2009

**Teaching Assistant****University of Wisconsin-Madison** (Madison, WI)

CHEM 511: Inorganic Chemistry

Spring 2007

CHEM 104: General Chemistry II

Spring 2004

CHEM 109H: Honors General Chemistry

Fall 2003

**Teaching Assistant****Hamilton College** (Clinton, NY)

CHEM 322: Physical Chemistry II

Spring 2003

CHEM 321: Physical Chemistry I

Fall 2002

**Teaching Workshops / Professional Development**

DEI HHMI STEM Collaborative Workshop

January 2022

Building Social Justice into Teaching and Learning Chemistry

October 2021

CSC New Faculty Workshop (Washington, D.C.)

August 2012

ACS Postdoc to Faculty Workshop (Boston, MA)

August 2010

CIRTL Diversity Workshop (Madison, WI)

August 2007

**Mentoring Experience****Graduate Research Advisees**

Kayla Johnson

2016 – current

Jacob Morris

2017 – current

Aarzo Grover

2018 – current

Bruce Lickey

2019 – current

Taylor Kocian

2019 – current

Aiman Nabi

2021 – current

Muyiwa Ayodele

2022 – current

Biswash Thakuri

2015 – 2020, Ph.D.

*Placement:* Sterling Pharma (Germantown, WI)

Ariel Schuelke-Sanchez

2014 – 2019, Ph.D.

*Placement:* Postdoctoral Fellow at Penn State University (State College, PA)

Matt Conger

2013 – 2018, Ph.D.

*Placement:* Postdoctoral Fellow at Boston University (Boston, MA)

Morgan Cousins

2012 – 2017, Ph.D.

*Placement:* Postdoctoral Fellow at Ursinus College (Collegeville, PA)

Amanda Graves

2011 – 2016, Ph.D.

*Placement:* Postdoctoral Fellow at Scripps Florida (Jupiter, FL)

Cheryl Lockhart

2011 – 2014, M.S.

*Placement:* Certifying Scientist at Keystone Laboratories (Asheville, NC)**Post Baccalaureate Research Advisees**

Erik Horak 2013 – 2014  
*Placement:* Graduate Student at University of Wisconsin (Madison, WI)

### Undergraduate Research Advisees

Emma Jones 2023 – current  
 Justin Moyer 2022 – current  
 Mirabella Vulikh 2022 – current  
 Kaitlyn Eckhert 2022 – current  
 Rebeka Mendelsohn 2021 – current  
 Megan Lavigne 2021 – current  
 Georgia Babb 2019 – 2021, B.S.  
 Adam Petrucci 2017 – 2021, B.S.  
 Claudia Ricatto 2020  
 Tanner James 2019  
 Alissa Stone (St. Lawrence University) 2018  
 Amanda Cornetta 2016 – 2019, B.S.  
*Placement:* Research Assistant at Children’s Hospital of Pennsylvania  
 Adam Weinheimer 2017 – 2018, B.S.  
 Nick Grubinger 2018  
 Lexi Haley (St. Lawrence University) 2017  
 Robert Tuttle 2014 – 2016, B.S.  
*Placement:* Graduate Student at Colorado State University (Fort Collins, CO)  
 Sommer Johansen 2012 – 2015, B.S.  
*Placement:* Graduate Student at University of California-Davis (Davis, CA)  
 Aliya Lapp 2013 – 2014, B.S.  
*Placement:* Graduate Student at University of Texas (Austin, TX)  
 Connor Payne 2014  
*Placement:* Graduate Student at Harvard University (Cambridge, MA)  
 Erik Horak 2012 – 2013, B.S.  
*Placement:* Graduate Student at University of Wisconsin (Madison, WI)  
 Cyril Lukianov 2013  
 Jill Chipman (Hamilton College, Materials Science REU) 2013  
*Placement:* Graduate Student at University of Wisconsin (Madison, WI)

### High School Research Advisees

Hope Petraro (Montpelier H.S., Project SEED) 2018  
 Deepika Pokhrel (S. Burlington H.S., Project SEED) 2015  
*Placement:* Undergraduate Student at University of Vermont (Burlington, VT)  
 Dylanger Pittman (Burlington H.S., Project SEED) 2012  
*Placement:* Undergraduate Student at Williams College (Williamstown, MA)

### Student Conference Presentations

34. **Kocian, T.A.J.;** Liptak, M.D. “Examination of the conformation – electronic structure – product relationship in non-canonical heme oxygenase catalyzed reactions” *Gordon Research Seminar: Bioinorganic Chemistry, 2023*, Ventura, CA (Talk).
33. **Lickey, B.;** Liptak, M.D. “Investigation of product inhibition as an origin for metal selectivity in chelataases” *Gordon Research Seminar: Bioinorganic Chemistry, 2023*, Ventura, CA (Poster).

32. **Grover, A.**; Conger, M.A.; Liptak, M.D. “Characterization of a ferryl=oxoheme form of staphylococcus aureus IsdG” *Chemistry and Biochemistry Graduate Research Conference*, **2022**, Montreal, PQ (Talk).
31. **Grover, A.**; Conger, M.A.; Liptak, M.D. “Characterization of a ferryl=oxoheme form of staphylococcus aureus IsdG” *Champlain Area Chemistry Symposium*, **2022**, Burlington, VT (Talk).
30. **Grover, A.**; Conger, M.A.; Liptak, M.D. “Characterization of a ferryl-oxoheme form of staphylococcus aureus IsdG” *263<sup>rd</sup> ACS National Meeting*, **2022**, San Diego, CA (Talk).
29. **Morris, J.A.**; Schuelke-Sanchez, A.E.; Liptak, M.D. “Assessment of the CfbA metal binding site and its affinity for naturally-abundant metals” *263<sup>rd</sup> ACS National Meeting*, **2022**, San Diego, CA (Talk).
28. **Petrucci, A.N.**; Cousins, M.E.; Liptak, M.D. “Structure-function relations: Modelling mega-Stokes shifts” *UVM Student Research Conference*, **2020**, Burlington, VT (Virtual).
27. **Thakuri, B.**; O’Rourke, B.; Liptak, M.D. “Time-resolved MS Studies Identify the Heme Degradation Products of *Mycobacterium tuberculosis* MhuD” *Gordon Research Seminar: Bioinorganic Chemistry*, **2020**, Ventura, CA (Poster).
26. **Thakuri, B.**; O’Rourke, B.; Liptak, M.D. “Time-resolved MS Studies Identify the Heme Degradation Products of *Mycobacterium tuberculosis* MhuD” *Chemistry and Biochemistry Graduate Research Conference*, **2019**, Montreal, PQ (Poster).
25. **Cornetta, A.C.**; Liptak, M.D. “Measurement of Changes in Heme Ruffling Caused by Heme-Degrading Enzyme, IsdG” *UVM Student Research Conference*, **2019**, Burlington, VT (Talk).
24. **Thakuri, B.**; Graves, A.; Chao, A.; Johansen, S.L.; Goulding, C.W.; Liptak, M.D. “Insights into Binding and Degradation of Heme by *Mycobacterium tuberculosis* MhuD” *257<sup>th</sup> ACS National Meeting*, **2019**, Orlando, FL (Talk).
23. **Schuelke, A.E.**; Liptak, M.D. “Assessing the Substrate Scope of the Chelatase CfbA” *257<sup>th</sup> ACS National Meeting*, **2019**, Orlando, FL (Talk).
22. **Cornetta, A.R.** “Measurement of Changes in Ruffling Caused by Heme-Degrading Enzyme, IsdG” *UVM Student Research Conference*, **2018**, Burlington, VT (Poster).
21. **Thakuri, B.**; Johansen, S.L.; Goulding, C.W.; Liptak, M.D. “Spectroscopic Investigation of Heme Binding by MhuD” *UVM Student Research Conference*, **2018**, Burlington, VT (Talk).
20. **Schuelke, A.E.**; Liptak, M.D. “Assessing the Substrate Scope of the Chelatase CfbA” *Gordon Research Seminar: Bioinorganic Chemistry*, **2018**, Ventura, CA (Poster).

19. **Thakuri, B.;** Johansen, S.L.; Goulding, C.W.; Liptak, M.D. "Spectroscopic Investigation of Heme Binding by MhuD" *Gordon Research Seminar: Bioinorganic Chemistry*, **2018**, Ventura, CA (Poster).
18. **Conger, M.A.;** Liptak, M.D. "<sup>1</sup>H and <sup>13</sup>C NMR of Azide-Inhibited IsdG Reveals Spin Density Delocalization" *Gordon Research Conference: Metals in Biology*, **2018**, Ventura, CA (Talk).
17. **Conger, M.A.;** Liptak, M.D. "Tight Binding of Heme to *Staphylococcus aureus* IsdG and IsdI Precludes Design of a Competitive Inhibitor" *UVM Student Research Conference*, **2017**, Burlington, VT (Talk).
16. **Schuelke, A.** "Spectroscopy-guided Design of Synthetic Selective Chelataes from CbiX<sup>S</sup>" *UVM Student Research Conference*, **2017**, Burlington, VT (Talk).
15. **Cousins, M.;** Qian, H.; Aprahamian, I.; Liptak, M. "Novel Mechanism of Molecular Rotor Fluorescence: Suppression of Kasha's Rule" *253<sup>rd</sup> ACS National Meeting*, **2017**, San Francisco, CA (Talk).
14. **Schuelke, A.** "Spectroscopy-guided Design of Synthetic Selective Nickel Chelataes from CbiX<sup>S</sup>" *Gordon Research Seminar: Bioinorganic Chemistry* **2017**, Ventura, CA (Talk).
13. **Conger, M.A.;** Liptak, M.D. "Tight Binding of Heme to *Staphylococcus aureus* IsdG and IsdI Precludes Design of a Competitive Inhibitor" *Gordon Research Seminar: Bioinorganic Chemistry* **2017**, Ventura, CA (Poster).
12. **Cousins, M.E.** "Understanding Aggregation-Induced Emission: Suppression of Kasha's Rule" *Advanced Next Generation Energy Leadership (ANGEL) Symposium* **2016**, Burlington, VT (Poster).
11. **Cousins, M.E.** "Understanding Aggregation-Induced Emission: Suppression of Kasha's Rule" *UVM Student Research Conference*, **2016**, Burlington, VT (Poster).
10. **Graves, A.B.;** Liptak, M.D. "Thermally-Accessible Electronic States of Cyanide-Inhibited Ferric Heme" *251<sup>st</sup> ACS National Meeting*, **2016**, San Diego, CA (Poster).
9. **Conger, M.A.** "Second-Sphere Perturbation of IsdG Modulates the Spin Density of the Heme Substrate" *Gordon Research Seminar: Bioinorganic Chemistry*, **2016**, Ventura, CA (Talk).
8. **Cousins, M.E.** "Suppression of Kasha's Rule: Understanding Aggregation-Induced Emission" *Gordon Research Seminar: Bioinorganic Chemistry*, **2016**, Ventura, CA (Poster).
7. **Cousins, M.E.** "Advances in Cobalt-59 Solution NMR: Studies of Cobalt Tetrapyrroles" *UVM Student Research Conference*, **2015**, Burlington, VT (Talk).
6. **Johansen, S.** "Spectroscopic Characterization of the A71F Variant of the Mycobacterium Heme Utilization Degradar" *UVM Student Research Conference*, **2015**, Burlington, VT (Talk).



5. **Graves, A.B.** “Second-Sphere Interactions: Fine Tuning the Electronic Structure of MhuD to Achieve Heme Degradation” *Gordon Research Seminar: Bioinorganic Chemistry*, **2015**, Ventura, CA (Poster).
4. **Cousins, M.E.** “Advances in Solution State  $^{59}\text{Co}$  NMR: Studies of Cobalt Tetrapyrroles” *Gordon Research Seminar: Bioinorganic Chemistry*, **2015**, Ventura, CA (Poster).
3. **Graves, A.B.** “The *Mycobacterium tuberculosis* MhuD Active Site Stabilizes a Ruffled Heme with an Unusual Electronic Structure” *Gordon Research Seminar: Bioinorganic Chemistry*, **2014**, Ventura, CA (Talk).
2. **Horak, E.H.** “Investigation of Heme Ruffling in IsdI” *UVM Student Research Conference*, **2013**, Burlington, VT (Poster).
1. **Lockhart, C.L.** “Investigating the Role of Hydrogen Bonding in Heme Degradation by the *S. aureus* Enzyme IsdG” *UVM Student Research Conference*, **2013**, Burlington, VT (Talk).

**SERVICE ACTIVITIES****DEPARTMENT OF CHEMISTRY, UNIVERSITY OF VERMONT**

<b>Graduate Affairs</b>	2017 – current
<b>Chair</b>	2017 – 2021
<b>Undergraduate Affairs</b>	2021 – current
<b>Bridge Funding Review Committee</b>	2022 – current
<b>Tenure-track Medicinal Chemistry Search, <i>ad hoc</i></b>	2022 – current
<b>Instrumentation, Safety, and Space</b>	2021 – 2022
<b>Infrastructure</b>	2017 – 2021
<b>Academic Program Review, <i>ad hoc</i></b>	2021
Outcome: Chemistry academic program review document	
<b>Tenure-track Physical Chemistry Search, <i>ad hoc</i></b>	2017 – 2018
Outcome: Prof. Ruggiero	
<b>Graduate Admissions</b>	2011 – 2017
<b>Chair</b>	2013 – 2017
<b>Academic Planning, <i>ad hoc</i></b>	2016
Outcome: Five-year hiring plan	
<b>Safety</b>	2014 – 2015
<b>Instrumentation</b>	2011 – 2015
<b>Tenure-track Physical Chemistry Search, <i>ad hoc</i></b>	2013 – 2014
Outcome: Profs. Jianing Li and Severin Schneebeli	
<b>NMR Facility Manager Search, <i>ad hoc</i></b>	2013 – 2014
Outcome: Dr. Monika Ivancic	
<b>Departmental Vision, <i>ad hoc</i></b>	2013
Outcome: Department Vision Statement	
<b>Graduate Standards</b>	2011 – 2012

**COLLEGE OF ARTS AND SCIENCES, UNIVERSITY OF VERMONT**

<b>Biochemistry B.S. Program Director</b>	2021 – current
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<b>Academic Planning and Budget Committee Chair</b>	2019 – 2022 2021 – 2022
<b>Academic Planning and Budget Committee Plus Chair</b> Outcome: Confidential Report to Dean Bill Falls	2022 2022
<b>Phi Beta Kappa Election/Induction</b>	2019 – 2021
<b>Department of Psychological Sciences Chair Review, <i>ad hoc</i> Chair</b> Outcome: Confidential Report to Dean Bill Falls	2020 2020
<b>Work/Life Balance Panel, <i>ad hoc</i></b> Outcome: Open forum with CAS faculty	2020
<b>Department of Chemistry Chair Review, <i>ad hoc</i></b> Outcome: Confidential Report to Dean Bill Falls	2018 – 2019
<b>Seed Grant Awards</b>	2014 – 2017
<b>Small Grant Research Awards</b>	2014 – 2017
<b>Interdisciplinary Experiential Engagement Awards</b>	2014 – 2017
<b>Faculty Research Support Awards (FRSA)</b>	2012 – 2017
<b>Nominations and Elections</b>	2014 – 2015
<b>Research Awards for the Natural and Social Sciences (RANSS)</b>	2012 – 2014
<b>Department of Chemistry Chair Search, <i>ad hoc</i></b> Outcome: Prof. Christopher Landry	2013 – 2014
<b>UNIVERSITY OF VERMONT</b>	
<b>Graduate College Dean Search, <i>ad hoc</i></b>	2022 – current
<b>Graduate College Executive Committee</b>	2021 – current
<b>Pre-medical Advisory Committee</b>	2022 – current
<b>Postdoc Position Updates Committee, <i>ad hoc</i> Chair</b> Outcome: Report to Dean Cindy Forehand	2021 – 2022 2021 – 2022
<b>ChemCats Faculty Advisor</b>	2018 – 2021

**UVM Faculty Senate** 2012, 2014 – 2017

**STEM Phase I Celebration, *ad hoc*** 2017

Outcome: STEM Complex Phase I Completion Celebration

## **EXTRAMURAL SERVICE**

### **ECHO Museum Outreach**

Fluorescent Foods Activity (Burlington, VT) Oct. 22-23, 2022

### **Grant Application Reviews, *ad hoc***

National Science Foundation 2012 – 2021

National Science Foundation, MPS-CHE-CLP CAREER panel 2019

Natural Sciences and Engineering Research Council of Canada 2017 – 2019

Department of Energy 2016

### **Journal Manuscripts Reviews, *ad hoc***

ACS Bio&Med Chem 2021

ACS Infectious Diseases 2019

ACS Omega 2017

Aggregate 2022

Angewandte Chemie International Edition 2019 – 2022

Applied Organometallic Chemistry 2017

Biochemistry 2017 – 2021

Biochemistry and Biophysics Reports 2021

Bioorganic & Medicinal Chemistry 2013

Biomolecules 2022

Chemistry (A European Journal) 2021

Chemistry of Materials 2018

Communications Biology 2022

Comprehensive Coordination Chemistry 2020

Dalton Transactions 2019

Inorganic Chemistry 2014 – 2022

Journal of the American Chemical Society 2014 – 2023

Journal of Biological Inorganic Chemistry 2018

Journal of Chemical Education 2017

Journal of Inorganic Biochemistry 2019 – 2022

Journal of Photochemistry and Photobiology 2015

Journal of Physical Chemistry 2008 – 2019

Nature Communications 2019

PLOS ONE 2018

Polyhedron 2014

Proceedings of the National Academy of Sciences 2020 – 2021

Science Advances 2021 – 2022

Theoretical Chemistry Accounts 2013

### **Session Presider, *ad hoc***

Bioinorganic Chemistry: Proteins & Enzymes (Boston, MA) Aug. 21, 2018

**Professional Development – Women in Science, *ad hoc***  
“Power Hour” Discussion Leader (Ventura, CA) Jan. 22, 2018

**Pre-School Outreach**  
Five Senses Activity (Colchester, VT) Feb. 15, 2018  
Five Senses Activity (Colchester, VT) Nov. 16, 2016

**Curriculum Review, *ad hoc***  
*Wentworth Institute of Technology*, Department of Sciences (Boston, MA)  
Proposal for B.S. in Applied Sciences 2013