

Matthew D. Liptak

University of Vermont
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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

- Associate Professor of Chemistry** 2018 – current
University of Vermont (Burlington, VT)
- Chemistry Ph.D. and M.S. Program Coordinator** 2017 – current
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

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 B₁₂ 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 B₁₂ 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 Co¹⁺Cobalamin: Spectral and Electronic Properties of the “Superreduced” B₁₂ 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_a 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_a 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_a 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_a 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

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” *256th ACS National Meeting*, **2018**, Boston, MA (Contributed Talk).
29. **Liptak, M.D.** “Spectroscopic Evidence for Electronic Control of Heme Hydroxylation by IsdG” *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” *253rd 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” *249th 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” *249th 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” *32nd 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” *240th 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*” *11th 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*” *236th 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 B₁₂ 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” *12th International Conference on Bioinorganic Chemistry*, **2005**, Ann Arbor, MI.
6. **Liptak, M.D.**; Shields, G.C. “Modeling the Inhibition of Cdc25B with QM/MM” *43rd Sanibel Symposium*, **2003**, St. Augustine, FL.
5. **Liptak, M.D.**; Feldgus, S.; Shields, G.C. “Absolute pK_a Determinations for Protonated Nitrogen Compounds” *Pfizer Summer Undergraduate Research Fellowship Program*, **2002**, Groton, CT.
4. **Liptak, M.D.** “Absolute pK_a Determinations for Substituted Phenols” *47th Annual Undergraduate Research Symposium: Rochester Section of the ACS*, **2002**, Geneva, NY.

3. **Liptak, M.D.**; Feldgus, S.; Shields, G.C. "Absolute pK_a Determination for Protonated Nitrogen Compounds" *1st 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_a Determinations for Substituted Phenols" *42nd Sanibel Symposium*, **2002**, St. Augustine, FL.
1. **Liptak, M.D.** "Accurate pK_a Calculations" *41st 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: 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 – 07/31/2021

Project Location: University of Vermont

Person-months per year to be devoted to the project: 2 summer 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 – 07/31/2020

Project Location: University of Vermont

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

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

Pending Support

Proposal Title: Metal Tetrapyrrole Biosynthesis: inserting the correct metal

Source of support: National Science Foundation

Project Role: PI

Direct Support: \$317,536

Total Award Amount: \$471,712

Total Award Period Covered: 06/01/2020 – 05/31/2023

Project Location: University of Vermont

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

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

Source of support: National Institutes of Health

Project Role: PI

Direct Support: \$1,000,000

Total Award Amount: \$1,499,082

Total Award Period Covered: 01/01/2021 – 12/31/2025

Project Location: University of Vermont

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

Completed Support

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. Celia W. Goulding, UC-Irvine

Prof. Kevin Kittilstved, UMass-Amherst

Prof. Mario Rivera, Kansas

Prof. Aimee Shen, Tufts

Prof. Eric P. Skaar, Vanderbilt

Hydrazone Fluorophores

M. tuberculosis MhuD, MmpL

EPR Spectroscopy

S. aureus IsdG

C. difficile CotA, SipL

S. aureus IsdG, IsdI

Affiliations

American Chemical Society

Phi Beta Kappa

Sigma Xi

Honors and Awards

New Talent: Americas 2016

Paul Saltman Award 2015

Ruth Kirschstein-NRSA 2009

Vilas Travel Grant 2007

M^cElvain 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****Associate Professor of Chemistry****University of Vermont** (Burlington, VT)

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
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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
 CHEM 321: Physical Chemistry I

Spring 2003
 Fall 2002

Teaching Workshops / Professional Development

CSC New Faculty Workshop (Washington, D.C.) August 2012
 ACS Postdoc to Faculty Workshop (Boston, MA) August 2010
 CIRTDL Diversity Workshop (Madison, WI) August 2007

Mentoring Experience

Graduate Research Advisees

Biswash Thakuri 2015 – current
 Kayla Johnson 2016 – current
 Jacob Morris 2017 – current
 Aarzo Grover 2018 – current
 Bruce Lickey 2019 – current
 Taylor Kocian 2019 – current
 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

Adam Petrucci 2017 – current
 Georgia Babb 2019 – current
 Claudia Ricatto 2020 – current
 Tanner James 2019
 Alissa Stone (St. Lawrence University) 2018
 Amanda Cornetta 2016 – 2019, B.S.
 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
<i>Placement:</i> Graduate Student at Harvard University (Cambridge, MA)	
Erik Horak	2012 – 2013, B.S.
<i>Placement:</i> Graduate Student at University of Wisconsin (Madison, WI)	
Cyril Lukianov	2013
Jill Chipman (Hamilton College, Materials Science REU)	2013
<i>Placement:</i> 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
<i>Placement:</i> Undergraduate Student at University of Vermont (Burlington, VT)	
Dylanger Pittman (Burlington H.S., Project SEED)	2012
<i>Placement:</i> Undergraduate Student at Williams College (Williamstown, MA)	

Student Conference Presentations

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" *257th ACS National Meeting*, **2019**, Orlando, FL (Talk).
23. **Schuelke, A.E.;** Liptak, M.D. "Assessing the Substrate Scope of the Chelatase CfbA" *257th 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. “¹H and ¹³C 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^S” *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” *253rd ACS National Meeting*, **2017**, San Francisco, CA (Talk).
14. **Schuelke, A.** “Spectroscopy-guided Design of Synthetic Selective Nickel Chelataes from CbiX^S” *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” *251st 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}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**

Graduate Affairs	2017 – current
Chair	2017 – current
Infrastructure	2017 – current
Tenure-track Physical Chemistry Search, <i>ad hoc</i>	2017 – 2018
Outcome: Prof. Ruggiero	
Graduate Admissions	2011 – 2017
Chair	2013 – 2017
Academic Planning, <i>ad hoc</i>	2016
Outcome: Five-year hiring plan	
Instrumentation	2011 – 2015
Safety	2014 – 2015
Tenure-track Physical Chemistry Search, <i>ad hoc</i>	2013 – 2014
Outcome: Profs. Jianing Li and Severin Schneebeli	
NMR Facility Manager Search, <i>ad hoc</i>	2013 – 2014
Outcome: Dr. Monika Ivancic	
Departmental Vision, <i>ad hoc</i>	2013
Outcome: Department Vision Statement	
Graduate Standards	2011 – 2012

COLLEGE OF ARTS AND SCIENCES, UNIVERSITY OF VERMONT

Department of Chemistry Chair Review, <i>ad hoc</i>	2018 – 2019
Outcome: Confidential Report to Dean Bill Falls	
Faculty Research Support Awards (FRSA)	2012 – 2017
Seed Grant Awards	2014 – 2017
Small Grant Research Awards	2014 – 2017
Interdisciplinary Experiential Engagement Awards	2014 – 2017
Nominations and Elections	2014 – 2015

Research Awards for the Natural and Social Sciences (RANSS) 2012 – 2014

Department of Chemistry Chair Search, *ad hoc* 2013 – 2014
Outcome: Prof. Christopher Landry

UNIVERSITY OF VERMONT

ChemCats Faculty Advisor 2018 – current

Phi Beta Kappa Election/Induction 2019 – current

UVM Faculty Senate 2012, 2014 – 2017

STEM Phase I Celebration, *ad hoc* 2017
Outcome: STEM Complex Phase I Completion Celebration

EXTRAMURAL SERVICE

Grant Application Reviews, *ad hoc*

National Science Foundation 2012 – 2019
Natural Sciences and Engineering Research Council of Canada 2017 – 2019
Department of Energy 2016

Journal Manuscripts Reviews, *ad hoc*

ACS Infectious Diseases 2019
ACS Omega 2017
Angewandte Chemie 2019
Applied Organometallic Chemistry 2017
Biochemistry 2017 – 2018
Chemistry of Materials 2018 – 2018
Comprehensive Coordination Chemistry 2020
Dalton Transactions 2019
Inorganic Chemistry 2014 – 2020
Journal of the American Chemical Society 2014 – 2018
Journal of Biological Inorganic Chemistry 2018
Journal of Chemical Education 2017
Journal of Inorganic Biochemistry 2019
Journal of Physical Chemistry 2008 – 2019
Journal of Photochemistry and Photobiology 2015
Nature Communications 2019
PLOS ONE 2018
Polyhedron 2014
Bioorganic & Medicinal Chemistry 2013
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

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