

12/13/23

**Mark J. Snider**  
**Robert E. Wilson Professor of Chemistry**

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<b>EDUCATION</b>	Ph.D. 2001	Biochemistry & Biophysics University of North Carolina – Chapel Hill Advisor: Professor Richard Wolfenden Dissertation title: <i>Thermodynamic Analysis of the Mechanism of Escherichia coli Cytidine Deaminase</i> © 2001
	B.A. 1997	Chemistry <i>Summa Cum Laude</i> Capital University, Columbus Ohio
<b>PROFESSIONAL APPOINTMENTS</b>	2015 – 2013 – 2012	Professor of Chemistry, The College of Wooster Robert E. Wilson Endowed Professorship in Chemistry Honorary Fellow, Department of Biochemistry, University of Wisconsin-Madison (sabbatical)
	2007 – 2008	Visiting Scientist, Department of Chemistry & Chemical Biology, Cornell University (sabbatical)
	2007 – 2015	Associate Professor of Chemistry, The College of Wooster
	2002 – 2007	Assistant Professor of Chemistry, The College of Wooster
	2001 – 2002	Postdoctoral Teaching/Research Fellow, Department of Chemistry, The College of Wooster (Mentor: Prof. Charles L. Borders, Jr.)
<b>RESEARCH LEAVES</b>	2018 – 2019; 2023	at The College of Wooster; Transient state kinetic analysis of the mechanism of 6-hydroxynicotinate-3-monooxygenase, and the genes of nicotinate degradation in <i>Bacillus niacini</i> .
	2012 – 2013	with Professor W. W. Cleland, Department of Biochemistry, University of Wisconsin, Madison, WI and with Professor David Ballou, Department of Biological Chemistry, University of Michigan, Ann Arbor, MI
	2007 – 2008	with Professor Tadhg P. Begley, Department of Chemistry & Chemical Biology, Cornell University, Ithaca, NY
<b>CURRENT RESEARCH</b>		Mechanistic and structural enzymology of bacterial nicotinic acid (vitamin B <sub>3</sub> ) degradation; Transient-state kinetics by stopped-flow spectrophotometry to investigate the mechanisms of flavin monooxygenases; Functional characterization of phosphagen kinases to understand molecular evolution of cooperative ligand binding and quaternary structure.

## EXTERNALLY-FUNDED RESEARCH GRANTS

- 2018-2023 National Science Foundation: Molecular Biophysics Program  
*RUI: Collaborative Research: Enzymology of Bacterial Nicotinic Acid Catabolism*  
by Mark Snider (PI, Wooster), Katherine Hicks (PI, SUNY Cortland) \$ 551,536
- 2016-2019: National Science Foundation: Major Research Instrumentation Program  
*Acquisition of an NMR Spectrometer to Sustain Excellence in Undergraduate Research*  
by Paul Bonvallet (PI), Judith Amburgey-Peters (Co-PI), Spring Knapp (Co-PI), Mark Snider (Co-PI) and Sarah Sobeck (Co-PI); \$343,697
- 2012-2014: Research Corporation for Science Advancement: Multi-Investigator Cottrell College Science Award Program: *Bacterial Degradation of Pharmaceuticals and Personal Care Products During Waste Water Treatment*; by Stephanie Strand (Microbiologist) and Melissa Schultz (Analytical Chemist) and Mark Snider (Biochemist); \$100,000
- 2008-2011: National Science Foundation: Major Research Instrumentation Program  
*Acquisition of an LC/MS/MS to Enhance Undergraduate Research and Teaching*  
by Melissa Schultz (PI), Paul Edmiston (Co-PI) and Mark Snider (Co-PI); \$ 226,115
- 2006-2009: National Science Foundation: Major Research Instrumentation Program  
*Acquisition of an Isothermal Titration Calorimeter*  
by Paul Bonvallet (PI), Don Jacobs (Co-PI) and Mark Snider (Co-PI); \$ 91,090
- 2004-2007: National Science Foundation: Metabolic Biochemistry Program  
*RUI: Comparative Structure – Function Analysis of Phosphagen Kinases*  
by Mark Snider (PI), Paul Edmiston (Co-PI) and Dean Fraga (Co-PI); \$ 320,307

## INTERNALLY-FUNDED COMPETITIVE RESEARCH GRANTS

- 2020: Hamburger Endowment for Collaborative Projects and Program Development Award; Genetic and Biochemical Characterization of the Nicotinic Acid Catabolism in *Bacillus niacini* Dean Fraga (Biology) and Mark Snider (Chemistry); \$3,000
- 2018-2023: Hamburger Endowment for Collaborative Projects and Program Development Award; Upgrades of the Brookhaven light scattering diode laser and addition of small volume cell adaptor for protein work by Susan Lehman (Physics) and Mark Snider (Chemistry)
- 2018: William H. Wilson Award; Acquisition of a Schlenk-line set-up for anaerobic research on nicotinate degradation enzymes; \$2,043
- 2017: Henry Luce III Award for Distinguished Scholarship to support mechanistic studies of the enzymes involved in bacterial nicotinate catabolism; \$6,645.
- 2017: Hamburger Endowment for Collaborative Projects and Program Development Award; Evolution of Inter-subunit Cooperativity in Protein Dimers by Dean Fraga (Biology) and Mark Snider (Chemistry) \$10,694
- 2017: William H. Wilson Award; Cloning and characterization of novel genes in *Bacillus niacini* involved in nicotinate degradation; \$1,500
- 2015: William H. Wilson Award; Cloning and characterization of novel *Bacillus niacini* nicAB genes; \$1,550.
- 2014-17: Clare Boothe Luce Mentor (Laura Sherer, BCMB '17) for the cloning and characterization of *Bacillus niacini* genes putatively involved in nicotinate degradation.
- 2013-15: Henry Luce III Award for Distinguished Scholarship to employ 2<sup>nd</sup> generation sequencing techniques to establish the nicotinate degradation gene cluster in *Bacillus* species; \$2,900.
- 2013-15: Clare Boothe Luce Mentor (Abigail Daniel, BCMB '15) for genetic and biochemical

- analysis of 6-hydroxynicotinate monooxygenase in *Bordetella pertussis*.
- 2013: Howard Hughes Medical Institute Undergraduate Science Education Program Award for summer research mentoring (1 student) and supplies; \$7,000
- 2013: Howard Hughes Medical Institute Undergraduate Science Education Program Award for analytical scale gel filtration columns and fraction collectors for the determination of oligomeric structures of enzymes in classroom and research projects; \$4,700.
- 2013: William H. Wilson Award; Acquisition of preparative scale high-resolution gel filtration column for preparation of the crystallization of enzymes for structural studies by X-ray diffraction; \$2,350.
- 2012: William H. Wilson Award; Acquisition of software for kinetic analysis of enzyme-catalyzed reactions by UV spectroscopy; \$1,200.
- 2012: Howard Hughes Medical Institute Undergraduate Science Education Program Award to investigate structure-function relationships in maleamate amidohydrolase by site-directed mutagenesis; \$2,000.
- 2011-12: Henry Luce III Award for Distinguished Scholarship to work with Professor W. W. Cleland at the University of Wisconsin-Madison for development of natural abundance kinetic isotope effects by isotope ratio mass spectrometry to determine the structure of the transition state for reactions catalyzed by maleamate amidohydrolase and 6-hydroxynicotinate monooxygenase; \$4,000
- 2011: Howard Hughes Medical Institute Undergraduate Science Education Program Award for summer research mentoring (5 students) and supplies; ~\$30,000
- 2010-11: Howard Hughes Medical Institute Undergraduate Science Education Program Award to employ modern DNA sequencing techniques to identify the genes expressed in *Pseudomonas* for degradation of Zoloft™ (sertraline); \$5,000
- 2010-11: Henry Luce III Award for Distinguished Scholarship to employ modern DNA sequencing techniques to identify the genes expressed in *Pseudomonas* for degradation of Zoloft™ (sertraline); \$5,000
- 2010-11: Howard Hughes Medical Institute Undergraduate Science Education Program Award for laboratory equipment to cryoprotect and transport protein crystals for x-ray structural studies of enzymes involved in nicotinic acid degradation; \$4,287
- 2010: Howard Hughes Medical Institute Undergraduate Science Education Program Award for summer research mentoring (7 students) and supplies; ~\$40,000
- 2010: William H. Wilson Award; Acquisition of reverse-phase HPLC columns for mechanistic studies of enzyme mechanisms by LC-mass spectrometry; \$1,000
- 2009: William H. Wilson Award; Acquisition of a table-top centrifuge for studies of microbial degradation of Zoloft™; \$1,800
- 2009: Howard Hughes Medical Institute Undergraduate Science Education Program Award for summer research mentoring & curriculum development; ~\$60,000
- 2008: William H. Wilson Award; Acquisition of affinity columns for purifying proteins of unknown function; \$ 677
- 2006: William H. Wilson Award; Acquisition of a muffle furnace for uncatalyzed biological reactions at high temperature; \$1,200
- 2003: William H. Wilson Award; Acquisition of reverse-phase HPLC columns for analysis of <sup>18</sup>O-kinetic isotope effects in the reaction catalyzed by creatine kinase; \$1,400
- 2003: Elizabeth Ralston Presidential Endowment for Faculty Development Award; \$2,500

## PEER-REVIEWED PUBLICATIONS (\*College of Wooster undergraduate)

### **Manuscripts in progress:**

M. J. Snider, I. Lee, M. Aryal\*, I. Eccles-James\*, J. Anquandah\*, J. Fishovitz, J. Graham\*, R. Klein\*, L. Marcze\*, L. Stetzik\*, G. Kerwood and D. Fraga; Evolution of inter-subunit communication in the phosphagen kinases: an alternating sites reactivity mechanism for catalysis; *manuscript in progress*– to be submitted to *Biochemistry*.

P. Chiaranunt\*, E. D. Sullivan\*, N. Spittle\*, M. Anderson, K. Morrison, D. Hilmey, R. S. Rowlett, and M. J. Snider; A structural and functional investigation of the catalytic role of Cys150-Asp29-Lys117 in maleamate amidohydrolase – *manuscript in progress, to be submitted to Biochemistry*.

J. Redick\*, M. Hlaing\*, R. Campbell\*, L. Rajakovich, and M. J. Snider (2024) Mechanistic insights into substrate ionization and decarboxylation by 6-hydroxynicotinate 3-monooxygenase with 5-Cl-6-hydroxynicotinate, an efficient substrate analogue – *manuscript in progress, to be submitted to Biochemistry*.

### **Manuscripts submitted for peer review or published:**

B. C. Richardson, Z. R. Turlington, S. V. Ferreira de Macedo, S. K. Phillips, K. Perry, S. G. Brancato, E. W. Cooke\*, J. R. Gwilt, A. J. Roering, F. M. Rossi, M. J. Snider, J. B. French and K. A. Hicks (2023) Structural and functional characterization of a novel class A flavin monooxygenase from *Bacillus niacini*. *Submitted to Biochemistry*

31. Z. R. Turlington; S. V. Ferreira de Macedo; K. Perry; S. L. Belsky\*; J. A. Faust; M. J. Snider and K. A. Hicks (2023) Ligand bound structure of a 6-hydroxynicotinic acid 3-monooxygenase provides mechanistic insights; *Accepted for publication in Archives in Biochemistry & Biophysics*
30. S. K. Phillips, S. G. Brancato, S. N. MacMillan, M. J. Snider, A. J. Roering and K. A. Hicks (2023) Synthesis, crystallographic and spectroscopic characterization of 2,6-dihydroxypyridine; *Acta Crystallographica Section E* 79. [DOI](#)
29. S. W. Perkins\*, M. Z. Hlaing\*, K. A. Hicks, L. Rajakovich, and M. J. Snider (2023) Mechanism of the multi-step catalytic cycle of 6-hydroxynicotinate 3-monooxygenase revealed by global kinetic analysis; *Biochemistry* 62; 1553-1567. [DOI](#)
28. P. Piper\*, B. Begres\*, M. Snider, and D. Fraga (2020) Two *cryptosporidia* species encode active creatine kinases that are not seen in other *Apicomplexa* species; *Comparative Biochemistry and Physiology - Part B* 246, 110459. [DOI](#)
27. D. Fraga., K. Stock\*, M. Aryal\*, C. Demoll\*, L. Fannin\*, and M. J. Snider (2019) Bacterial arginine kinases have a highly skewed distribution within the Proteobacteria. *Comparative Biochemistry and Physiology - Part B* 233, 60-71. [DOI](#)
26. K. D. Nakamoto\*, S. W. Perkins\*, R. G. Campbell\*, M. R. Bauerle\*, T. G. Gerwig\*, S. Gerislioglu, C. Wesdemiotis, M. A. Anderson, K. A. Hicks and M. J. Snider (2019) Mechanism of 6-hydroxynicotinate 3-monooxygenase, a flavin-dependent decarboxylative hydroxylase involved in aerobic nicotinic acid degradation. *Biochemistry* 58; 1751-1763. [DOI](#)
25. K. A. Hicks, M. E. Yuen, W.- F. Zhen, T. J. Gerwig\*, R. W. Story\*, M. Kopp, and M. J. Snider (2016) Structural and biochemical characterization of 6-hydroxynicotinic acid 3-monooxygenase, a novel decarboxylative hydroxylase involved in aerobic nicotinate degradation. *Biochemistry* 55, 3432–3446. [DOI](#)

24. D. Fraga, M. Aryal\*, J. E. Hall\*, E. Rae\*, and M. Snider (2015) Characterization of the arginine kinase isoforms in *Caenorhabditis elegans*. *Comparative Physiology and Biochemistry; Part B: Biochemistry & Molecular Biology* 187; 85-101. [DOI](#)
23. Z. H. Harvey\* and M. J. Snider (2014) Draft genome of the nicotinate-metabolizing soil bacterium *Bacillus niacini* (DSM 2923) *Genome Announc.* 2 (6) e01251-14. [DOI](#)
22. A. Palmer\*, B. Begress\*, J. Van Houten\*, M. J. Snider, and D. Fraga (2013) Characterization of a putative oomycete taurocyamine kinase: Implications for the evolution of the phosphagen kinase family. *Comparative Physiology and Biochemistry; Part B: Biochemistry & Molecular Biology*, 166; 173-181. [DOI](#)
21. G. K. Schroeder, L. Zhou, M. J. Snider, X. Chen, and R. Wolfenden (2012) The flight of a cytidine deaminase complex with an imperfect transition state analogue inhibitor: mass spectrometric evidence for the presence of a trapped water molecule. *Biochemistry* 51, 6476-6486. [DOI](#)
20. J. Bragg, A. Rajkovic\*, C. Anderson, R. Curtis, J. V.-Houten\*, B. Begres\*, C. Naples\*, M. Snider, D. Fraga and M. Singer (2012) Identification and characterization of an arginine kinase from *Myxococcus xanthus* required for fruiting body formation and cell differentiation; *J. Bacteriology* 194, 2668-2676. [DOI](#)
19. V. A. Kincaid\*, E. D. Sullivan\*, R. D. Klein\*, Jeff W. Noel\*, R. S. Rowlett, M. J. Snider (2012) Structure and catalytic mechanism of nicotinate (vitamin B<sub>3</sub>) degradative enzyme maleamate amidohydrolase from *Bordetella Bronchiseptica* RB50; *Biochemistry* 51, 545-554. [DOI](#)
- Review 18. A. Hazra, M. J. Snider, A. Chatterjee, D. Chatterjee, J. W. Hanes, D. G. Hilmey, K. Krishnamoorthy, K. M. McCulloch, S. O'Leary, J. M. Sanders, M. J. Waitner, and T. P. Begley. Coenzyme and prosthetic group biosynthesis; *Encyclopedia of Microbiology*; Moselio Schaechter, Ed. (2009) Vol. 5, 79-88, Oxford: Elsevier. [Link](#)
17. L. D. Andrews\*, J. Graham\*, M. J. Snider, D. Fraga. (2008) Characterization of a novel bacterial arginine kinase from *Desulfotalea psychrophilia* – *Comparative Physiology and Biochemistry; Part B: Biochemistry & Molecular Biology* 150: 312-319. [DOI](#)
16. M. J. Jourden\*, C. N. Clarke\*, A. K. Palmer\*, E. J. Barth, R. C. Prada\*, R. N. Hale\*, D. Fraga, M. J. Snider, P. L. Edmiston (2007) Changing the substrate specificity of creatine kinase from creatine to glycoxyamine: evidence for a highly evolved active site. *Biochimica et Biophysica Acta – Proteins and Proteomics* 1774: 1519-1527. [DOI](#)
15. M. J. Jourden\*, M. J. Thomenius\*, P. R. Geiss\*, L. A. Horst\*, M. M. Barty\*, G. B. Mulligan\*, R. M. Almeida\*, B. A. Kersteen\*, N. R. Myers\*, M. J. Snider, C. L. Borders, Jr., P. L. Edmiston (2005) Transition state stabilization by six arginines clustered in the active site of creatine kinase. *Biochimica et Biophysica Acta – Proteins and Proteomics* 1751: 178-183. [DOI](#)
14. C. H. Borchers, V. E. Marquez, G. K. Gottfried, S. E. Short, M. J. Snider, P. Speir and R. Wolfenden (2004) Fourier transform ion cyclotron resonance mass spectrometry reveals the presence of a water molecule in an enzyme-transition state analogue complex. *Proceedings of the National Academy of Sciences – USA* 101: 15341-15345. [DOI](#)
- Review 13. M. Snider, B. Temple and R. Wolfenden (2004) The path to the transition state in enzyme reactions: a survey of catalytic efficiencies. *Journal of Physical Organic Chemistry* 17: 586-591. [DOI](#)

12. C. L. Borders, Jr., K.M. MacGregor\*, P. L. Edmiston, E. R. K. Gbeddy\*, M. J. Thomenius\*, G. B. Mulligan\*, and M. J. Snider (2003) Asparagine 285 plays a key role in transition state stabilization in rabbit muscle creatine kinase. *Protein Science* 12: 532-537. [DOI](#)
11. J.M. Cox\*, C.A. Davis\*, C. Chan\*, M.J. Jourden\*, A.M. Jorjorian\*, M.J. Brym\*, M.J. Snider, C.L. Borders, Jr., P.L. Edmiston (2003) Generation of an active site monomer of rabbit muscle creatine kinase by site-directed mutagenesis: the effect of quaternary structure on catalysis and stability. *Biochemistry* 42: 1863-1871. [DOI](#)
10. C. L. Borders, Jr., M. J. Snider, R. Wolfenden, and P. L. Edmiston (2002) Determination of the affinity of each component of a composite quaternary transition-state analog complex of creatine kinase. *Biochemistry* 41: 6995-7000. [DOI](#)
9. M. J. Snider, D. Lazarevic, and R. Wolfenden (2002) Catalysis by entropic effects: the action of cytidine deaminase on 5,6-dihydrocytidine. *Biochemistry* 41: 3925-3930. [DOI](#)
8. M. J. Snider, L., Reinhardt, R. Wolfenden, and W. W. Cleland (2002) <sup>15</sup>N kinetic isotope effects on uncatalyzed and enzymatic deamination of cytidine. *Biochemistry* 41: 415-421. [DOI](#)
- Review 7. R. Wolfenden and M. J. Snider (2001) The depth of chemical time and the power of enzymes as catalysts. *Accounts of Chemical Research* 34: 938-945. [DOI](#)
6. M. J. Snider and R. Wolfenden (2001) Site-bound water and the shortcomings of a less-than-perfect transition state analogue. *Biochemistry* 40: 11364 - 11371. [DOI](#)
5. B. G. Miller, M. J. Snider, R. Wolfenden, and S. A. Short. (2001) Dissecting a charged network at the active site of orotidine 5'-monophosphate decarboxylase. *Journal of Biological Chemistry* 276:15174-15176. [DOI](#)
4. M. J. Snider and R. Wolfenden (2000) The rate of spontaneous decarboxylation of amino acids. *Journal of the American Chemical Society* 122: 11507-11508. [DOI](#)
3. M. J. Snider, S. Gaunitz, C. Ridgway, S. A. Short, and R. Wolfenden (2000) Temperature effects on the catalytic efficiency, rate enhancement, and transition state affinity of cytidine deaminase, and the thermodynamic consequence for catalysis of removing a substrate 'anchor'. *Biochemistry* 39: 9746-9753. [DOI](#)
2. B. G. Miller, M. J. Snider, S. A. Short, and R. Wolfenden (2000) Contribution of enzyme-phosphoryl contacts to catalysis by orotidine 5'-phosphate decarboxylase. *Biochemistry* 39: 8113-8118. [DOI](#)
1. R. Wolfenden, M. Snider, C. Ridgway, and B. Miller (1999) The temperature dependence of enzyme rate enhancements. *Journal of the American Chemical Society* 121: 7419-7420. [DOI](#)

#### PRESENTATIONS AT PROFESSIONAL MEETINGS (\*College of Wooster Undergraduate; presenter)

Mark J. Snider and Katherine A. Hicks (2024) Novel enzymology of nicotinic acid degradation in *Bacillus niacini*. [28<sup>th</sup> Enzyme Mechanisms Conference](#), Naples, FL, January 2024.

Mark J. Snider, Jack Redick, May Hlaing and Lauren Rajakovich (2023) Probing substrate specificity in the class A flavin enzyme 6-hydroxynicotinate 3-monooxygenase; [Midwest Enzyme Chemistry Conference](#), Northwestern University, Evanston, IL, September 2023.

Takoda T. Zuehlke\*, Jack Donahue\*, and Mark J. Snider (2023) Identification of a Putative Binding Mechanism for the Reducing Substrate of 6-Hydroxynicotinate 3-Monooxygenase; *American Society of Biochemistry & Molecular Biology National Meeting*, Seattle, WA. [\[Honorable Mention for Best Poster in Enzymology Section of the ASBMB National Undergraduate Poster Competition\]](#)

Eric Senanu Adadevoh\* and Mark J. Snider (2023) Exploring the Binding Multiplicity, Mode of Inhibition and Communication between NADH Binding Sites on 6-Hydroxynicotinate 3-Monooxygenase (NicC); *American Society of Biochemistry & Molecular Biology National Meeting*, Seattle, WA.

Kira Boyce\*, Katherine Olson\*, and Mark J. Snider (2023) A Critical Role for a *CoxG* Homologue in the Function of *B. Niacini* Nicotinate Dehydrogenase; *American Society of Biochemistry & Molecular Biology National Meeting*, Seattle, WA.

Sam L. Belsky\*, Sipara H. Semu\*, Mark J. Snider, Zachary R. Turlington, and Katherine A. Hicks (2023) Defining the Role of A Conserved Motif at the Interface of the Substrate and FAD binding sites in FAD dynamics in class A flavin Monooxygenases: A Case Study of 6-Hydroxynicotinate-3-Monooxygenase; *American Society of Biochemistry & Molecular Biology National Meeting*, Seattle, WA.

Robby Beal\*, Merlin Li\*, Dean Fraga and Mark J. Snider (2022); Determining whether tightness of binding in the active site of a dimeric taurocyamine kinase plays a role in inducing negative cooperativity; *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1. [\[Honorable Mention for Best Poster in Protein Structure/Function and Enzymology Section of the ASBMB National Undergraduate Poster Competition\]](#)

Sam Belsky\* and Mark J. Snider (2022) Exploring the promiscuity potential of 6-hydroxynicotinate-3-monooxygenase: consequences to catalysis of adding a nitrogen at C5 within the substrate's aromatic ring; *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1, R2629.

Joel Brown\* and Mark J. Snider (2022) Effector or substrate: characterizing the molecular features of 6-HNA that govern enhanced rates of NADH oxidation and hydroxylation by 6-hydroxynicotinate-3-monooxygenase (NicC); *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1, R3990. [\[Winner, Best Poster Presentation in Protein Structure/Function and Enzymology Section of the ASBMB National Undergraduate Poster Competition\]](#).

Emilee Haines\*, Zoë Semersky\*, Luke Borgelt\*, and Mark J. Snider (2022); Determination and Characterization of Genes that Encode the Nicotinate Dehydrogenase and 6-Hydroxynicotinate Dehydrogenase Complexes within the Nicotinic Acid Degradation Pathway by *Bacillus niacini*; *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1.

May Z. Hlaing\*, Ryan Campbell\*, and Mark J. Snider (2022); Investigating substrate specificity for 6-hydroxynicotinate 3-monooxygenase (NicC) With coumalic acid: consequences to catalysis of replacing or removing the ring nitrogen. *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1, R3597.

Sai K. Khal\*, Noah Helton\* and Mark J. Snider (2022) Elucidating the nicotinic acid degradation pathway in *Bacillus niacini*: Biochemical Characterization of proteins of unknown function; *American Society of Biochemistry & Molecular Biology National Meeting*, FASEB J 36, S1.

Merlin Li\*, Dean Fraga, and Mark J. Snider; Evidence of negative cooperativity in cytosolic taurocyamine kinase from *Arenicola brasiliensis* and its implications in the evolution of the phosphagen kinase family. *10<sup>th</sup> Annual Southeast Enzyme Conference*, Virtual, April 2021.

Mark J. Snider, Scott W. Perkins\*, Ryan G. Campbell\*, and Lauren Rajakovich; Critical role for substrate ionization in the mechanism of 6-hydroxynicotinate 3-monooxygenase. *Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways*, Waterville Valley, NH, July **2019**.

Scott W. Perkins\* and Mark J. Snider; Mechanism of 6-hydroxynicotinate 3-monooxygenase (NicC), a flavin-dependent decarboxylative hydroxylase involved in aerobic nicotinic acid catabolism. *26<sup>th</sup> Enzyme Mechanisms Conference*. New Orleans, LA, January **2019**.

Katherine A. Hicks, Tariq Hussain, Scott W. Perkins\*, Kent Nakamoto\*, and Mark J. Snider; Characterization of the catalytic mechanism of NicC, a 6-hydroxynicotinic acid 3-monooxygenase using active site variants. *Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways*, Waterville Valley, NH, July **2018**. [Selected for an oral presentation]

Scott W. Perkins\* and Mark J. Snider (**2018**) Investigating putative key catalytic residues and uncoupled hydroperoxyflavin formation in the mechanism of 6-hydroxynicotinate-3-monooxygenase, a decarboxylative-hydroxylase in bacterial nicotinate catabolism; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **32**:655.13 [[Honorable Mention for Best Poster in Metabolism and Bioenergetics Section of the ASBMB National Undergraduate Poster Competition](#)]

Kent Nakamoto\*, Selim Gerislioglu, and Mark J. Snider (**2018**) Determining the mechanism of 6-hydroxynicotinate 3-monooxygenase (NicC), an enzyme involved in nicotinate degradation; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **32**:655.14

Nathan Brownstein\*, and Mark J. Snider (**2018**) Expression and functional characterization of active nicotinic acid dehydrogenase from *Pseudomonas fluorescens* Pf5; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **32**:796.8

Sydney Fine\*, and Mark J. Snider (**2018**) Elucidating the Role of a Putative Monooxygenase in the Catabolism of Nicotinic Acid and Nicotine by *Bacillus niacini*; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **32**:536.4

Kaeli Zoretich\*, Sydney Fine\*, and Mark J. Snider (**2018**) The Catabolism of Nicotinic Acid and Nicotine and the Role of a Putative Monooxygenase in *Bacillus niacini*; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **32**:536.6

Kent Nakamoto\*, Scott W. Perkins\*, and Mark J. Snider (**2018**) Determining the mechanism of 6-hydroxynicotinate 3-monooxygenase (NicC). Meeting-in-Miniature, Cleveland Section of the American Chemical Society, Oberlin College, March 2018.

Scott W. Perkins\*, Kent Nakamoto\* and Mark J. Snider (**2017**) Investigating the role of covalent intermediates in the mechanism of 6-hydroxynicotinic acid 3-monooxygenase, a decarboxylative-hydroxylase in bacterial nicotinate catabolism; *Midwest Enzyme Chemistry Conference*, Loyola University of Chicago, October 2017.

Kathleen Kalafatis\* and Mark J. Snider (**2017**) Characterization of the nicotinic acid and 6-hydroxynicotinic acid dehydrogenase complexes in *Bacillus niacini*; *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **31**:919.3

Tsun Ki Jerrick To\* and Mark J. Snider (**2017**) Genetic and functional characterization of the enzyme of nicotinic acid degradation in *Bacillus niacini*. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J* **31**:624.6



Laura Sherer\*, Mark Snider, Maria\_Eirini Pandelia, and Roger Rowlett (2017) Cofactor analysis of nicotinate dehydrogenase and 6-hydroxynicotinate dehydrogenase in *Bacillus niacini*. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 31:919.4**

Mark J. Snider and Katherine Hicks; Structural and mechanistic studies of 6-hydroxynicotinic acid 3-monooxygenase: A novel decarboxylative hydroxylase in bacterial nicotinate catabolism. *25th Enzyme Mechanisms Conference*, St. Pete Beach, FL, January 2017.

Katherine A. Hicks, Meigan E. Yuen, Wei Feng Zhen, Anna M. Szostek, Tyler J. Gerwig\*, Ryan W. Story\*, Matthew R. Bauerle\*, Alvi Sakib\* and Mark J. Snider; Characterization of the catalytic mechanism of NicC, a 6-hydroxynicotinic acid 3-monooxygenase; *Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways*, July 2016.

Mark J. Snider; Structures and mechanisms of nicotinate catabolizing enzymes: A model system for investigating bacterial *N*-heterocyclic aromatic compound degradation and for undergraduate education. Central Eastern Regional Meeting of the American Chemical Society; Covington, KY, May 2016.

Nicholas P. Lesner\*, Michael T. Peterson, and Mark J. Snider (2016) Characterization and Identification of Metabolites in the Oxidation of Nicotinic Acid by *Bacillus Niacini*. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 30:834.9**

Morgan A Dasovich\*, Mark J Snider, and Michael T Peterson (2016) Characterization of a Novel Flavin-dependent Monooxygenase in *Bacillus niacini*. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 30:834.8**

Jessica A Meek\*, Laura A Sherer,\* and Mark J Snider (2016) Deciphering the Metal Dependency of Novel Nicotinate Hydroxylase from *Bacillus niacini*. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 30:1083.13**

Meigan E. Yuen, Weifeng Zhen, Megan C. Kopp, Tyler Gerwig\*, Mark J. Snider, and Katherine A. Hicks (2015) Structural and Biochemical Characterization of *Pseudomonas putida* KT2440 NicC, a 6-Hydroxynicotinic Acid 3-Monooxygenase. Annual Meeting of the American Crystallographic Association.

Tyler J Gerwig\*, Meigan Yuen, Weifeng Zhen, Mark A Anderson, Katherine Hicks and Mark J Snider (2015) Structure and mechanism of 6-hydroxynicotinate 3-monooxygenase (NicC). *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 29:572.23.**

Abigail K Daniel\* and Mark J Snider (2015) Elucidating the nicotinic acid degradation pathway in *Bacillus niacini*; *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 29:573.19.**

Lauren Buyan\* and Mark J Snider (2015) Virulence modulation of *Bordetella pertussis* via inhibition of the nicotinate degradation pathway. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 29:LB201.**

Gentry J Kerwood\*, Manish Aryal\*, Brittany Van Houten\*, Dean M Fraga and Mark Snider (2015) Exploring the structural basis for negative cooperativity in the phosphagen kinase superfamily. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 29:724.12.**

Karan Malani\* and Mark J. Snider (2015) Inhibition and kinetic isotope effect studies to further characterize the mechanism of maleamate amidohydrolase. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 29:572.13.**

M. J. Snider, Z. Harvey\*, H. Kondow\*, P. Chiaranunt\*, and M. Anderson; Mechanistic studies of nicotinate degrading enzymes and the identification of a novel nic cluster in *Bacillus niacini*; *Enzyme Structure and Function - 37<sup>th</sup> Steenbock Symposium*, University of Wisconsin – Madison, WI; May **2014**.

H. Kondow\*, and M. J. Snider (**2014**) Investigation of *B. bronchiseptica* maleamate amidohydrolase (NicF) substrate specificity. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 28:584.3**.

M. Aryal\*, and M. J. Snider (**2014**) Testing the versatility of the alternating sites of reactivity mechanism in the phosphagen kinases. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 28:768.11*. [**Honorable Mention for Best Poster in DNA & Chromosomes Section of ASBMB National Undergraduate Poster Competition**]

P. Chiaranunt\*, J. Sprano\*, A. Daniels\* and M. J. Snider (**2014**) Investigation of the nicotinate degradation pathway in *Bordetella pertussis* and its connections to whooping cough. *American Society of Biochemistry & Molecular Biology National Meeting*; **FASEB J 28:LB266**.

Z. Harvey\* and M. J. Snider (**2014**) Functional genomic elucidation of nicotinic acid catabolism in *Bacillus niacini*: Towards a metabolic engineering approach to environmental remediation. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 28:980.2* [**Honorable Mention for Best Poster in Bioenergetics Section of ASBMB National Undergraduate Poster Competition**]

J. B. Claybourne\*, E. Shi\*, S. Strand, M. Schultz and M. J. Snider (**2014**) Biodegradation of venlafaxine. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 28:B289*.

M. M. Schultz, M. J. Snider and S. S. Strand (**2013**) Antidepressants contaminate your water! Investigations to determine whether bacteria can remediate. *Global Liberal Arts Alliance International Conference on Water*, The College of Wooster.

C. Young, M. J. Snider and D. Fraga (**2013**) A curriculum based on research as pedagogy: A research project-based approach to teaching techniques in BCMB prepares students for senior independent study projects; *ASBMB Special Symposium on Student-Centered Education in the Molecular and Life Sciences*; Seattle University, Seattle, WA.

M. J. Snider, P. Chiaranunt\*, E. Sullivan\*, K. Morrison, and D. Hilmey (**2013**) Investigating the catalytic role of Cys150-Asp29-Lys117 in the mechanism of maleamate amidohydrolase. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 27:lb62*.

M. R. Bauerle\*, W. Ammons\*, K. Shvets\* and M. J. Snider (**2012**) Analysis of substrate specificity of 6-hydroxynicotinate-3-monooxygenase (NicC) from *Bordetella bronchiseptica*. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 26:963.13*

S. Justice\* and M. J. Snider (**2012**) Investigation of the potential role of 6-hydroxynicotinate monooxygenase in the modulation of virulence in *Bordetella pertussis*. *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 26:731.8*

J. E. Noel\*, N. E. Spittle\* and M. J. Snider (**2012**) On the role of Cys150 in the mechanism of maleamate amidohydrolase (NicF). *American Society of Biochemistry & Molecular Biology National Meeting*; *FASEB J 26:756.20*

Brittany Begres\*, A. Palmer\*, J. V. Houten\*, M. J. Snider, and D. Fraga (**2012**) Characterization of a hypotaucyamine kinase from the protozoan, *Phytophthora sojae*, and its implications on the evolution

of substrate specificity in the phosphagen kinase family. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **26**:963.12

M. J. Snider, M. Bauerle\*, W. Ammons\*, K. Shvets\*, and E. Sullivan\*; Aerobic catabolism of nicotinic acid (vitamin B<sub>3</sub>) in *Bordetella bronchiseptica*: mechanistic studies of NicC and NicF; *Midwest Enzyme Chemistry Conference*, The University of Chicago; Oct. **2011**.

M. T. Henke\* and M. J. Snider; A mechanistic proposal for extradiol-like hydroquinone dioxygenases; *Midwest Enzyme Chemistry Conference*, The University of Chicago; Oct. **2011**.

J. Van Houten\*, A. Palmer\*, K. Herring\*, M. J. Snider, and D. Fraga (**2011**); Characterization of the *Phytophthora sojae* hypotaurocyamine kinase suggests early evolution of quaternary structure in the phosphagen kinase family. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:928.14

M. J. Snider, B. A. Palanski\*, Z. Rotter\*, and X. Li (**2011**); Identification of the ligands of TM0486 from *Thermotoga maritima* by ESI-TOF mass spectrometry suggests role in a novel thiamin salvage pathway. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:923.4

M. T. Henke\* and M. J. Snider (**2011**); Mechanistic studies of 2,5-dihydropyridine 5,6-dioxygenase (NicX) from *Bordetella bronchiseptica*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:714.2

E. D. Sullivan\* and M. J. Snider (**2011**); Mechanistic studies of maleamate amidohydrolase (NicF) from *Bordetella bronchiseptica*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:714.7

R. Klein\*, R. S. Rowlett, and M. J. Snider (**2011**); Structural studies of maleamate amidohydrolase (NicF) from *Bordetella bronchiseptica*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:714.4

M. Bauerle\*, R. Story\*, and M. J. Snider (**2011**); Mechanistic studies of 6-hydroxynicotinate 3-monooxygenase (NicC) from *Bordetella bronchiseptica*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J* **25**:715.2

M. J. Snider, B. A. Palanski\*, A. Young\* and Z. Rotter\*; Guilt by association: functional annotation of TM0486 from *Thermotoga maritima* by identification of its bound ligands. *22nd Enzyme Mechanisms Conference*, St. Petersburg, FL, January **2011**.

M. J. Snider, E. Sullivan\*, M. Henke\*, R. Klein\*, M. Bauerle\*, V. Kincaid\*, R. Story\* and R. Rowlett; Aerobic catabolism of nicotinic acid in *Bordetella bronchiseptica*: mechanistic studies of NicC, NicF and NicX. *22nd Enzyme Mechanisms Conference*, St. Petersburg, FL, January **2011**.

K. A. Stencel\*, M. Krasnor\*, C. K. Koechli\*, S. S. Strand, M. J. Snider and M. M. Schultz; Transformation of sertraline by aerobic sludge; *Proceedings of the 31<sup>st</sup> Society of Environmental Toxicology and Chemistry North American Meeting*, Portland, OR, November **2010**.

E. A. Sakach\*, M. J. Snider, H. L. Schoenfuss, M. M. Schultz; Accumulation of antidepressant pharmaceuticals in fish; *Proceedings of the 31<sup>st</sup> Society of Environmental Toxicology and Chemistry North American Meeting*, Portland, OR, November **2010**.

A.K. Palmer\*, D. Fraga, M. Snider and P. Edmiston (2010) Characterization of a dimeric arginine kinase in the protozoan, *Phytophthora sojae*, suggests an early origin of phosphagen kinase dimers. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **24**:469.7

V.A. Kincaid\* and M.J. Snider (2010) Nicotinic acid degradation in *Bordetella bronchiseptica*: mechanistic studies of the novel enzyme NicF. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **24**:835.7 [**Honorable Mention for Best Poster in Protein Section of ASBMB National Undergraduate Poster Competition**]

B.A. Palanski\* and M.J. Snider (2010) Guilt by association: functional annotation of TM0486 from *Thermotoga maritima* by identification of its bound ligands. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **24**:518.3 [**Honorable Mention for Best Poster in Systems Biology Section of ASBMB National Undergraduate Poster Competition**]

M. J. Snider (2008) Negative cooperativity in transition state binding enhances rate of product release in phosphagen kinases; *40<sup>th</sup> Central Regional Meeting of the American Chemical Society*; Columbus, OH.

M. P. McGinley\*, D. Fraga and M. Snider (2008) Evolution of cooperativity in the phosphagen kinase family. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **22**: 1004.3

V. M. Andrus\*, D. Thomas\*, T. Meulia, M. Snider, and D. Fraga (2008) Characterization of the arginine kinase family of *Caenorhabditis elegans*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **22**: 1004.4

C. Clarke\*, and M. J. Snider (2007) Rate of spontaneous hydrolysis of creatine to estimate the catalytic proficiency of creatine amidinohydrolase. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **21**: 650.5

S. Agidi\*, and M. J. Snider (2007) Catalytic role of His232 in the mechanism of *Pseudomonas putida* creatine amidinohydrolase. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **21**: 805.2

D. H. Thomas\*, and M. J. Snider (2007) Investigating the physiological roles and intracellular localization of an arginine kinase in *Caenorhabditis elegans*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **21**: 510.11

J. Graham\*, and L. Stetzik\*, M. J. Snider; Investigating cooperative ligand binding by rabbit muscle creatine kinase using isothermal titration calorimetry. *Midwest Enzyme Chemistry Conference*, Northwestern University, IL. September 2006.

M. J. Snider, I. Lee, I. Eccles-James\*, J. Anquandah\*, J. Graham\*, and L. Stetzik\*; Dimerization enhances rate of product release in phosphagen kinase family. *Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways*, University of New England, ME. July 2006.

J. Anquandah\*, I. G. Eccles-James\*, I. N. W. Lee, and M. J. Snider (2006) A mechanistic role for protein oligomerization in the phosphagen kinase family. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **20**: A44-a

E. E. Gustely\* and M. J. Snider (2006) Analysis of the role of His232 in the mechanism of *Ps. putida* creatinase. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **20**: A43-d

H.-D. Nguyen\*, and M. J. Snider (2006) Is the ATP analogue adenosine 5'-sulfatopyrophosphate an alternative substrate or inhibitor of creatine kinase? *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **20**: A43-b

B. D. Pipitone\*, and M. J. Snider (2006) Determining the subcellular localization of a novel arginine kinase in *Caenorhabditis elegans*. *American Society of Biochemistry & Molecular Biology National Meeting; FASEB J.* **20**: A900-b

L. A. Horst\*, Z.-M. Tun\*, J. B. Tout\*, M. J. Jourden\*, J. A. Bayuk\*, J. M. Shear\*, M. J. Snider; Thermodynamic analysis of substrate binding and activation by rabbit muscle creatine kinase. *19<sup>th</sup> Enzyme Mechanisms Conference*, Pacific Grove, CA, January **2005**.

M. R. Buckley\*, V. Miraldi\*, M. J. Snider; Rate of spontaneous phosphoryl transfer between ATP and creatine. *227<sup>th</sup> ACS National Meeting*; Anaheim, CA, March **2004**.

C. Chan\*, M. J. Snider, W. S. Kirk, W. W. Cleland; Primary <sup>18</sup>O kinetic isotope effects on phosphoryl transfer by creatine kinase. *227<sup>th</sup> ACS National Meeting*; Anaheim, CA, March **2004**.

J. J. Ellinger\*, M. J. Snider, W. S. Kirk, W. W. Cleland; Primary <sup>18</sup>O kinetic isotope effects for arginine kinase-catalyzed phosphoryl transfer from ATP. *227<sup>th</sup> ACS National Meeting*; Anaheim, CA, March **2004**.

D. E. Freeman\*, M. J. Snider; Is creatine kinase catalytically promiscuous? *227<sup>th</sup> ACS National Meeting*; Anaheim, CA, March **2004**.

J. E. Hall\*, M. J. Snider; Biochemical characterization of a *Caenorhabditis elegans* arginine kinase. *227<sup>th</sup> ACS National Meeting*; Anaheim, CA, March **2004**.

R. Wolfenden, M. J. Snider; A transition state analogue complex in the vapor phase; *18<sup>th</sup> Enzyme Mechanisms Conference*; Galveston Island, TX, January **2003**.

M. Borders, M. J. Snider, Geiss, P.R.\* , Jourden, M.J.\* , Kersteen, E.A.\* , Moore, N.R.\* , McBride, L.C.\* , Rohan, M.C.\* , Almeida, R.M.\* , Gbeddy, E.R.K.\* , Mulligan, G.B.\* , MacGregor, K.M.\* , Lake, B.A.\* , Bohl, J.L.\* , Terrano, D.T.\* , Edmiston, P.L.; Creatine kinase is more than positive about it: roles of each component of a six-arginine cluster at the active site in binding and catalysis; *18<sup>th</sup> Enzyme Mechanisms Conference*; Galveston Island, TX, January **2003**.

J. M. Rackley\*, C. L. Borders, Jr., M. J. Snider; Temperature dependence of the catalytic activity of rabbit muscle creatine kinase; *16<sup>th</sup> National Conference on Undergraduate Research*, University of Wisconsin - Whitewater, WI, April **2002**.

D. R. Korstjens\*, M. J. Snider, C. L. Borders, Jr.; Renaturation of insoluble mutants of creatine kinase; *16<sup>th</sup> National Conference on Undergraduate Research*, University of Wisconsin - Whitewater, WI, April **2002**.

R. Wolfenden, Mark J. Snider; Site-bound water and the limitations of a potential transition state analogue inhibitor; *Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways*, Meriden, NH, July **2001**.

M. J. Snider, R. Wolfenden; Thermodynamic role of site bound water in transition state and transition state analogue binding by cytidine deaminase; *17<sup>th</sup> Enzyme Mechanisms Conference*; Marco Island, FL, January **2001**.

M. J. Snider, S. Gaunitz, C. Ridgway, R. Wolfenden; Temperature dependence of the transition state affinity of cytidine deaminase; *219<sup>th</sup> ACS National Meeting*; San Francisco, CA, March **2000**.

#### INVITED RESEARCH TALKS

- 2017 Dept. of Chemistry, SUNY-Buffalo
- 2016 Central Regional American Chemical Society Meeting, Covington, KY.
- 2013 Natural Science Division, Rio Grande University, OH
- 2012 Dept. of Chemistry, University of Toledo, OH
- 2011 Dept. of Chemistry & Biochemistry, Denison University, OH  
Dept. of Physiology and Biophysics, Case University, Cleveland, OH
- 2009 Dept. of Biochemistry & Biophysics, U. North Carolina - Chapel Hill
- 2008 Dept. of Chemistry, Capital University  
40th Central Regional Meeting of the American Chemical Society;  
Symposium in honor of Prof. Ming-Daw Tsai; Columbus, OH  
Dept. of Chemistry, Ithaca College, Ithaca NY  
Dept. of Biol. & Chem. Sciences, Wells College, Aurora, NY
- 2007 Dept. of Chemistry, The Ohio State Univ., Columbus, OH
- 2006 Dept. of Biochemistry & Molecular Biol., Pennsylvania State Univ.  
Dept. of Chemistry, The Univ. of Akron  
Begley Laboratory, Cornell Univ.
- 2005 Dept. of Chemistry, Michigan State Univ.  
Dept. of Biochemistry & Biophysics, Univ. North Carolina – C.H.
- 2004 The Wooster Section of the American Chemical Society; at Ashland Univ.
- 2003 Dept. of Medicinal Chem & Mol. Pharm., Purdue Univ.  
Dept. of Chemistry, Capital Univ.
- 2002 Dept. of Chemistry, Beloit College  
Dept. of Chemistry, John Carroll Univ.  
Dept. of Chemistry, Middlebury College  
Wooster Area Molecular Biology Association, OARDC, OSU
- 2001 Structural Biology & Biotechnology Symposium, Chapel Hill, NC

#### PROFESSIONAL MEMBERSHIPS

- American Society for Biochemistry & Molecular Biology 2005–
- American Chemical Society: Biological Division & Chemical Education 1993–
- Council on Undergraduate Research 1999–2007

#### COURSES TAUGHT AT THE COLLEGE OF WOOSTER (\*course taught regularly)

- Controversies in Science and Public Policy (Chemistry 103; chemistry course for non-science majors)
- Chemistry Tutorial: The Life and Death of a Molecule (CHEM 400)
- First-Year Seminar in Critical Inquiry (Interdepartmental writing intensive course for incoming students)
- General Chemistry I (CHEM 111)
- General Chemistry II and Laboratory (CHEM 112)
- Organic Chemistry Laboratory (CHEM 211L and 212L)
- Organic Chemistry II (CHEM 212)
- \*Techniques in Biochemistry & Molecular Biology (BCMB 303)
- \*Principles of Biochemistry (BCMB 331)
- \*Biochemistry of Metabolism (BCMB 332)
- Biophysical Chemistry (CHEM 334)

- Advanced Biochemistry Tutorials (BCMB 400)
- \*Introduction to Independent Study (BCMB 401)
- \*Senior Independent Study (CHEM & BCMB 451/452)

## ELECTED AND APPOINTED COMMITTEE SERVICE AT THE COLLEGE OF WOOSTER

Biochemistry & Molecular Biology Curriculum Committee, <i>Chairperson</i>	2001-present 2008-2011; 2020-2023
College of Wooster Scholarships at State Science Day, <i>Judging Chairperson</i>	2001-2007; 2009-2010; 2014 2001-2007
College Scholars Examination Committee	2001-2004
Conference with Trustees Committee ( <b>elected</b> )	2020-2022
Department of Chemistry <i>Chairperson</i>	2013-2016
EPC Sub-Committee for Assessing Quantitative Reasoning Courses	2006
Faculty Development Committee	2008-2009
Faculty Research & Study Leaves Committee	2008-2009
Financial Advisory Committee ( <b>elected</b> )	2004-2006
Five-Year Strategic Planning, Priorities Advisory Committee ( <b>elected</b> )	2004
Henry J. Copeland Funds for Independent Study Committee	2002-2004; 2006-2007
Howard Hughes Medical Institute Steering Committee	2011-2012
Interfaith Campus Ministries Advisory Board	2003-2007
Life Sciences Planning Committee and Ruth W. Williams Hall of Life Science Facility <i>Co-Building Shepherd</i> (with Dr. Dean Fraga)	2011-2018 2013-2018
Pre-Health Advisory Committee	2003-2007
Teaching Staff and Tenure Committee ( <b>elected</b> ) <i>Co-Chair</i> (with Provost)	2009-2012; 2018; 2023- 2011-2012; 2023-
Upperclassman Programs Committee	2003-2004
Wellness Program Committee	2006-2007

## SCHOLARLY COMMUNITY SERVICE

Middle School Science Fair Judge at St. Mary Elementary School, Wooster	2018; 2019; 2020; 2023
Scientific Judge at the ASBMB National Undergraduate Poster Competition	2018; 2022
NSF Grant Proposal Review Panel	2017; 2021; 2023
Curriculum Reviewer for Department of Chemistry, Elon University	April 2016
Preparing Future Faculty (Ohio State University) Mentor	2009 – 2010
Instructor, B-WISER Summer Camp for 8 <sup>th</sup> Grade Girls	2006; 2019; 2022
Chemistry Faculty Mentor, Council of Undergraduate Research	2006 – 2008
Technical Expert, Wayne County Local Emergency Planning Committee	2011– 2013

## PEDAGOGICAL DEVELOPMENT

Inclusive Research Mentoring Faculty Learning Community, College of Wooster, HHMI	2023-2024
KinTek New Enzymology Kinetics Workshop; Brno, Czech Republic	May 2019
ASBMB Regional Workshop at The College of Wooster (co-hosted with Dean Fraga) <i>Implementing Vision and Change Using Concept-Driven Teaching Strategies</i>	March 2015
ASBMB Regional Workshop at Kentucky Wesleyan University, Owensboro, KY: <i>Implementing Vision and Change Using Concept-Driven Teaching Strategies</i>	May 2014
ASBMB Special Symposium on Student-Centered Education in the Molecular and Life Sciences; Seattle, WA. Poster presentation entitled, with Crystal Young: <i>A curriculum based on research as pedagogy: A research project-based approach to teaching techniques in BCMB prepares students for senior independent study projects</i>	August 2013
Wooster Faculty Workshop: First-Year Seminars in Critical Inquiry	May 2011
POGIL Workshop; Washington College; Chestertown, MD	June 2008

American Academy of Colleges & Universities: <i>The importance of institutional, disciplinary, and interdisciplinary definitions of scholarship</i> ; The Student as Scholar: Undergraduate Research and Creative Practice; Long Beach, CA.	April 2007
Hewlett-Mellon Presidential Discretionary Fund for Institutional Renewal: A Comprehensive Examination of Introductory Science and Mathematics Courses Five Colleges of Ohio Assessment Conference, Wooster, Ohio	2006-2007 February 2006
Project Kaleidoscope National Colloquium: Translating How People Learn into a Roadmap for Institutional Transformation; Kansas City, Missouri	October 2005
Wooster Faculty Workshop: First-Year Seminars in Critical Inquiry	May 2004
Wooster Faculty Workshop on Teaching and Learning: "How Well Are Students Learning What We're Teaching?" with Thomas A. Angelo	February 2004
Project Kaleidoscope Assembly: Motivating Students to Pursue Careers in STEM Fields; Oberlin College, Oberlin, Ohio	September 2003
Wooster Faculty Workshop on Writing in the Sciences with J. Pechenik	April 2003
Wooster Faculty Conference on Teaching and Learning	May 2002

### SENIOR INDEPENDENT STUDY THESIS RESEARCH ADVISEES (84 graduates)

#	I.S. Advisee	Grad Year	Major	Thesis Title	Post-Wooster
1	Davin R. Korstjens	2002	Biochemistry	The attempted refolding of the insoluble rabbit muscle creatine kinase R214K mutant into an active enzyme.	M.S. (2005) in BioMedical Sciences, Univ. of Colorado
2	Jane M. Rackley	2002	Chemistry	The temperature dependence of the catalytic activity of rabbit muscle creatine kinase.	M.Ed. Carlow Univ. (2012); H.S. Chemistry Teacher
3	Jennifer A. Bayuk	2003	Biochemistry	Temperature effects on substrate binding and activation by creatine kinase.	D.O. (2008) Kirksville College of Osteopathic Medicine
4	Virginia A. Miraldi	2003	Biochemistry	Development of a quantitative protocol using <sup>31</sup> P NMR spectroscopy to study the reaction of the spontaneous phosphoryl transfer from MgATP to creatine.	M.D. (2007) CWRU; Assistant Professor, Department of Ophthalmology, U. Cincinnati
5	Tabetha D. Shelly	2003	Biochemistry	The expression and purification of a <i>C. elegans</i> arginine kinase.	Research Scientist, R&D, Leiner Health Products, NC; Registered Nurse at Piedmont Medical Center
6	Marshall R. Buckley	2004	BCMB	Progress toward measuring the rate of spontaneous phosphoryl transfer from MgATP to creatine.	MBA, Boston College (2008)]
7	Chikio Chan	2004	BCMB	Progress toward measuring primary <sup>18</sup> O kinetic isotope effects on phosphate transfer by creatine kinase.	Ph.D., Biochemistry, Yale University (2010); Asset Management, Colorado
8	James J. Ellinger	2004	BCMB	Determining the rate-limiting step of the reaction catalyzed by <i>Stichopus japonicus</i> arginine kinase by viscosity variation.	Ph.D., Biochemistry, Univ. of Wisconsin (2012); Assistant Professor, The University of Tokyo, Japan
9	Dena E. Freeman	2004	BCMB	Is creatine kinase catalytically promiscuous?: synthesis, purification and kinetic analysis of adenosine 5'-sulfatopyrophosphate as a potential substrate for creatine kinase.	MPH, Univ. of Washington (2008)
10	Joseph E. Hall	2004	BCMB	Biochemical characterization of a novel <i>Caenorhabditis elegans</i> arginine kinase through linked-enzyme kinetic assay analysis.	M.D., Univ. of Cincinnati (2008); ENT Fellow, Vanderbilt Univ.; Practicing ENT in Columbus, OH
11	Ijeoma G. Eccles-James	2005	BCMB	Investigating a catalytic role of dimerization for creatine kinase.	M.Sc. in Immunology, Imperial College, London, UK (2007); Research Associate, UC-SF
12	Jennifer L. Shrock	2005	BCMB	Exploring the amino acid determinants of cooperative transition state binding by creatine kinase.	BSN, Regis University (2010)
13	Jason B. Tout	2005	Chemistry	Thermodynamic changes accompanying the binding of MgADP in a composite, quaternary transition state analogue complex by creatine kinase.	M.Ed., Boston College (2008); High school science teacher
14	Lauren M. Wagner	2005	BCMB	Exploring the cellular localization of a novel arginine kinase in <i>Caenorhabditis elegans</i> by fluorescence microscopy.	Ph.D., Molecular Biology, Univ. of Pittsburgh (2012)
15	Juliana Anquandah	2006	BCMB	Investigating a mechanistic role for protein oligomerization in the phosphagen kinase family.	M.D., St. George's University, Grenada, West



					Indies (2013); Obstetrics-Gynecology Residency
16	Erin E. Gustely	2006	BCMB	Investigating the mechanism of creatinase	M.S., Biochemistry, Yale University (2007); High school science teacher
17	Hai Dang Nguyen	2006	BCMB	ATP analogue, adenosine 5'-sulfatopyrophosphate: an alternative substrate or inhibitor of creatine kinase?	Ph.D., Biochemistry, Univ. of Minnesota (2012); Post-doctoral Fellow at Harvard Medical School; Assistant Professor, Department of Pharmacology, Univ. of Minnesota (2019-)
18	Baldassare Daniel Pipitone	2006	BCMB	Examining the physiological role of an arginine kinase in <i>Caenorhabditis elegans</i> .	D.O., Ohio University (2010); Neuro-radiology Fellow, Univ. Michigan (2017); practicing radiologist
19	Perfect Senyo Agidi	2007	BCMB	Kinetic mechanism of <i>Pseudomonas putida</i> creatine Amidinohydrolase by isothermal titration calorimetry.	D.O. (2015) Nova Southeastern University, Florida; Internal Medicine Specialist, Akron
20	Chafen Clarke	2007	BCMB	Catalytic proficiency of creatine amidinohydrolase	DDS (2015) The University of the West Indies, Jamaica
21	David H. Thomas	2007	BCMB	Determining the sub-cellular localization of an arginine kinase in <i>Caenorhabditis elegans</i> .	M.D., Univ. of Cincinnati (2012); Internal Medicine, Case Univ. Hospital
22	Christopher Chapman	2009	Chemistry	Kinetic analysis of spontaneous creatine hydrolysis by <sup>1</sup> H NMR and creatine amidinohydrolase catalyzed creatine hydrolysis by isothermal titration calorimetry.	Chemist at PPG Industries, Inc.
23	Stephanie Edmisson	2009	BCMB	Investigating the role of the IQ67 domain in the interaction between SUN and calmodulin: an endeavor into the treacherous world of protein expression by <i>Escherichia coli</i> (under the direction of Dr. Esther van der Knaap, OARDC)	High School Biology Teacher
24	Theodore Moore III	2009	BCMB	Characterization of a putative monooxygenase involved in NAD catabolism	Ph.D., (2015) Microbiology, Univ. Wisconsin-Madison; Post-doctoral Fellow, MIT; Program Lead, Gingko Bioworks, Cambridge MA.
25	Allyson Palmer	2010	BCMB	Expression and characterization of <i>Phytophthora sojae</i> phosphagen kinases	M.D. Ph.D. (2018), The Mayo Clinic, MN
26	Ryan W. Story	2010	BCMB	NAD catabolism: identification of a 6-hydroxynicotinate 3-monooxygenase in <i>Bordetella bronchiseptica</i>	M.D. (2014) The Ohio State University; Residency, Vanderbilt Univ.; Practicing pulmonologist
27	Virginia Kincaid	2010	Chemistry	Nicotinic acid degradation in <i>Bordetella bronchiseptica</i> : kinetic studies of the hydrolytic deamidase NicF.	Ph.D. Biochemistry (2017) Univ. of Wisconsin – Madison; Senior Research Scientist, Promega Corp.
28	David Flannely	2010	Chemistry	Wastewater, the new lipstick in feminization: the analytical determination of a range of endocrine disruptors in the Chicago watershed.	Teach for America Program; M.S. Environmental Toxicology/Chemistry, Cornell University; High School Science Teacher
29	Roger D. Klein	2011	A.C.S.- Certified Biochemistry, BCMB, & Physics	A structure-function analysis of maleamic acid amidinohydrolase (NicF) from <i>Bordetella bronchiseptica</i>	M.D. Ph.D. (2020), Washington University, St. Louis; Residency in Urology, Univ. Pittsburgh
30	Matthew T. Henke	2011	BCMB	Developing a mechanistic proposal for 2,5-dihydropyridine-5,6-dioxygenase (NicX) from <i>Bordetella bronchiseptica</i> .	Ph.D. (2016) Integrative Biological Sciences, Northwestern University; Post-Doctoral Fellow, Harvard University; Assistant Professor of Pharmacology, University of Illinois at Chicago (2022)
31	Brad A. Palanski	2011	A.C.S. - Biochemistry	An investigation of the ability of <i>Pseudomonas fluorescens</i> to degrade the antidepressant sertraline (Zoloft®)	Ph.D. (2018), Chemistry, Stanford University; Post-Doctoral Fellow, Harvard Medical School; Director of Biochemistry,

					Vaccine Company Inc., San Francisco, CA (2022)
32	Eric D. Sullivan	2011	BCMB	Mechanistic studies of maleamate amidohydrolase (NicF) from <i>Bordetella bronchiseptica</i> RB50.	Ph.D. (2016), Chemical Biology, University of Michigan; Post-doctoral Fellow, NIEHS, Raleigh, NC
33	Matthew R. Bauerle	2012	A.C.S.-certified Chemistry	Structure-function analysis of 6-hydroxynicotinate 3-monooxygenase.	Ph.D. (2018), Chemistry, Pennsylvania State University; Senior Research Chemist, Exemplify Biopharma, Inc.
34	Jonathon Fox	2012	BCMB	Isolation of bacterial strains in wastewater sludge capable of degradation of sertraline, venlafaxine and triclocarban.	MS (2017), Biomedical Engineering, Cleveland State University; Engineer at MED Institute, West Lafayette, IN
35	Samantha Justice	2012	BCMB	Investigation of the potential role of 6-hydroxynicotinate-3-monooxygenase in the modulation of virulence in <i>Bordetella pertussis</i>	Ph.D. student, Biological and Biomedical Sciences, Univ. Southern California
36	Jeffrey E. Noel	2012	BCMB	Investigation in the catalytic mechanism of maleamate amidohydrolase (NicF) from <i>Bordetella bronchiseptica</i> RB50	unknown
37	Nicholas E. Spittle	2012	BCMB	Probing the role of cysteine-150 in maleamate amidohydrolase (NicF) catalysis from <i>Bordetella bronchiseptica</i> RB50 by site-directed mutagenesis.	D.O. (2016) Ohio University College of Osteopathic Medicine; Orthopedic surgeon
38	Zachary Harvey	2014	A.C.S.-certified Biochemistry	Defining the Genome and <i>nic</i> Cluster of <i>Bacillus niacini</i> .	Ph.D. (2019) Chemical & Systems Biology, Stanford University; Post Doctoral Fellow at the Gregor Mendel Institute, Vienna, Austria
39	Manish Aryal	2014	BCMB	Evolution of negative cooperativity in phosphagen kinases	Ph.D. student, Molecular Biophysics and Structural Biology Program, Carnegie Mellon / Univ. Pittsburgh
40	Pailin Chiaranunt	2014	BCMB & Philosophy	A scientific paradigm shift from reductionism to holism: the potential relationship between nicotinate degradation and virulence modulation in <i>Bordetella pertussis</i>	Ph.D. student, Immunology, University of Toronto, Canada
41	Helena Kondow	2014	BCMB	Elucidation of <i>Bordetella bronchiseptica</i> maleamate amidohydrolase (NicF) substrate specificity	Ph.D. (2020) Biochemistry & Biophysics, Texas A&M University; ORISE Fellow; Business Development Manager, Gainsville, VA.
42	Jacob Sprano	2014	BCMB & History	Pertussis, pellagra, and poverty: a historical and scientific analysis of whooping cough's associations with poverty and pellagra, and the nicotinate degradation pathway in <i>Bordetella pertussis</i>	M.D. (2019), Kansas City University of Medicine; Resident in Family and Community Medicine, Univ. of Nevada, Reno, NV
43	James Claybourne IV	2014	Neuroscience/BCMB	An analysis of the bioremediation of venlafaxine using aerobic bacteria	applying to law school
44	Lauren Buyan	2015	Neuroscience/BCMB	Virulence modulation of <i>Bordetella pertussis</i> via inhibition of the nicotinate degradation pathway	D.O. (2019), College of Osteopathic Medicine of the Pacific Northwest, Oregon; Residency in Emergency Medicine, Univ of Nebraska Med Center
45	Abigail Daniel	2015	BCMB	Cloning and expression of the novel proteins in the <i>Bacillus niacin</i> nicotinic acid degradation pathway and an initial attempt to characterize the NicAB complex	Apprenticeship in sustainable agriculture, Philadelphia, PA; High school biology teacher
46	Tyler Gerwig	2015	Chemistry	Assessing mechanistic proposals of 6-hydroxynicotinate-3-monooxygenase (NicC) from <i>B. bronchiseptica</i> .	D.O. (2020) Ohio University College of Osteopathic Medicine; Internal Medicine Residency, US Naval Medical Center, Portsmouth, VA.
47	Karan Melani	2015	BCMB	Inhibition and kinetic isotope effect studies to further characterize the mechanism of maleamate amidohydrolase (NicF).	D.P.M. (2019), Temple University; Practicing in Naples, FL
48	Alvi Sakib	2016	BCMB	Investigating the proposed acid-base catalyzed mechanism for 6-hydroxynicotinate 3-monooxygenase (NicC)	M.B.A. (2018) University of Michigan; Business Consultant, Deloitte,

					Chicago, IL
49	Morgan Dasovich	2016	BCMB	The partial characterization of a monooxygenase in <i>Bacillus niacini</i>	Ph.D. (2023), Chemical Biology, Johns Hopkins University; Post-doctoral Fellow at Johns Hopkins Univ.
50	Melia Kovach	2016	BCMB	Generation of a $\Delta$ nicC <i>Bordetella pertussis</i> mutant: investigating the relationship between nicotinic acid degradation and virulence modulation.	Physician Assistant / MPH (2020); Northeastern University. Practicing PA in Boston, MA.
51	Nicholas Lesner	2016	A.C.S.-certified Chemistry	Attempted synthesis of 2,3,6-trihydroxypyridine and characterization of the putative ring-cleavage enzyme in <i>Bacillus niacini</i> nicotinate catabolism	Ph.D. (2021), Biochemistry and Biophysics, Univ. of Texas – Southwest Medical Center; Post-doctoral Fellow, Univ. Penn.
52	Dylan McCreary	2016	A.C.S.-certified Chemistry	Investigation of the functionality of the nicotinic acid degradation pathway of <i>Bordetella pertussis</i> as a potential treatment of whooping cough	M.D. (2020), Univ. of Minnesota Medical School; Residency in Internal Medicine, Univ of Arizona
53	Jessica Meek	2016	BCMB	Deciphering the metal dependency of novel nicotinic acid dehydrogenases from <i>Bacillus niacini</i>	M.D. (2020), Univ. College Cork School of Medicine, Ireland; Residency in Internal Medicine, Brown University.
54	Jack Harrington	2017	Chemistry	Elucidating the mechanism of oxidative decarboxylation of 6-hydroxynicotinate by 6-hydroxynicotinate 3-monooxygenase (NicC) through kinetic analysis	Teaching English in China
55	Kathleen Kalafatis	2017	Neuroscience/BCMB	An attempt to characterize the multi-subunit nicotinic acid and 6-hydroxynicotinic acid dehydrogenase complexes in the nicotinic acid degradation pathway of <i>Bacillus niacini</i>	D.O. student, Lincoln Memorial University DeBusk College of Osteopathic Medicine
56	Laura Sherer	2017	BCMB	Biophysical characterization of the cofactors in the putative NicAB complex from <i>Bacillus niacini</i>	Ph.D. (2022) Univ. of Minnesota
57	Tsun Ki Jerrick To	2017	BCMB	Characterizing the genetic determinants of the nicotinic acid degradation pathway in <i>Bacillus niacini</i>	Ph.D. (2022), Univ. of Pennsylvania; Consultant with Boston Consulting Group
58	Nathan Brownstein	2018	BCMB	Attempt at expression of a functional recombinant nicotinate dehydrogenase from <i>Bacillus niacini</i>	Ph.D. student, Brandeis Univ.
59	Sydney Fine	2018	BCMB	<i>Niacini</i> , now you don't: the catabolism of nicotinic acid and nicotine and the role of a putative monooxygenase enzyme	Research Intern, Fred Hutchinson Cancer Center, Seattle, WA; MPH student, Global Health Epidemiology Program, The University of Michigan
60	Kent Nakamoto	2018	A.C.S.-certified Chemistry	Elucidating the mechanism of 6-hydroxynicotinate 3-monooxygenase, an enzyme involved in aerobic degradation of nicotine	M.D. (2022) The Ohio State University
61	Derek Schwarz	2018	BCMB	<i>Help! Help! I'm being repressed!</i> : An in-depth analysis of the IclR and its <i>in vitro</i> oligomerization	Ph.D. student, University of Akron
On leave	Ryan Campbell	2019	BCMB	<i>A Mechanistic Investigation: Probing the Substrate Promiscuity of 6-hydroxynicotinic acid 3-monooxygenase (NicC) from Bordetella bronchiseptica RB50</i>	Post-Baccalaureate Research, NIH; Ph.D. student, Dartmouth
On leave	Kaeli Zoretich	2019	BCMB	<i>Progress Towards Understanding Nicotinic Acid Degradation and the nic Operon in B. niacini Using Differential Gene Expression Analysis</i>	M.D. student, The Ohio State University
62	Anh Dinh	2020	BCMB	Differential expression analysis of the <i>nic</i> cluster and attempts at characterizing the NicAB complexes in novel nicotinic acid degradation pathway of <i>Bacillus niacini</i>	Ph.D. student in Biochemistry, Virginia Tech
63	Noah Helton	2020	BCMB	Progress in characterizing a novel root exudate: differential gene expression of <i>Bacillus niacini</i> DMS 2993 in response to nicotinic acid through RNAseq	Ph.D. student in Genetics, University of Michigan
64	Brent Pedersen	2020	BCMB	Swapping the N-termini of mitochondrial and cytoplasmic taurocyamine kinase from <i>Arenicola brasiliensis</i> in order to study the importance of the interactions between the N and C termini in controlling substrate binding and specificity	applying to medical school
65	Scott Perkins	2020	Neuroscience/BCMB	The binding and kinetic mechanisms of 6-hydroxynicotinate 3-monooxygenase (NicC), a decarboxylative hydroxylase involved in nicotinate degradation	M.D. student, Cleveland Clinic Lerner College of Medicine, CWRU

66	Phillip Plotkin	2020	Neuroscience/ BCMB	Determining the roles of arginine 184 and arginine 108 of 6-hydroxynicotinic acid 3-monoxygenase (NicC) from <i>Bordetella bronchiseptica</i> RB50 in substrate binding.	
67	Anneliese Wagoner	2020	BCMB	More than you bargained for: the attempted confirmation and characterization of a novel arginine kinase in <i>Moorea producents</i>	Ph.D. student in Molecular & Cellular Biology, Ohio University
68	Luke Borgelt	2021	BCMB	Reconstitution of hydroxylation activity of recombinant NDH and 6-HDH complexes from <i>Bacillus niacini</i>	Researcher at Boston Hospital; MD student, Univ of Toledo
69	Emmalee Cooke	2021	BCMB	Identification of substrate specific arginine kinases and Taurocyamine kinase in the study of phosphate kinase evolution within flatworms.	Researcher at CWRU, then applying to medical school
70	Daniel Fleming	2021	BCMB	Establishing a functional heterologous expression system for <i>Bacillus niacini</i> nicotinate dehydrogenase and 6-hydroxynicotinate dehydrogenase using <i>E. coli</i>	DDS student, The Ohio State University
71	Wenhao "Martin" Hu	2021	BCMB	Homology modeling and protein-ligand structural analysis of the <i>Bacillus niacini</i> NicAB protein complex	M.S. (2023) Florida State Univ.; PhD student at University College London
72	Mingyuang "Merlin" Li	2021	BCMB	Evidence of negative cooperativity in cytosolic Taurocyamine kinase from <i>Arenicola brasiliensis</i> and its implication in the evolution of the phosphagen kinase family	Ph.D. student, Johns Hopkins Univ.
73	Connor Mangan	2021	BCMB	Elucidating the biodegradative pathway of nicotinic acid by <i>Bacillus niacini</i> : defining the biochemical action of <i>Bn</i> DUF	U.S Navy Medical School
74	Jack Redick	2021	BCMB	Characterization of substrate promiscuity for 6-hydroxynicotinate-3-monoxygenase: a transient kinetic investigation of the decarboxylative-hydroxylation of 5-Cl-6-hydroxynicotinic acid	M.D. student, The Ohio State University
75	Robert Beal	2022	BCMB	Role of tight binding in negative cooperativity in the dimeric mitochondrial taurocyamine kinase from <i>Arenicola brasiliensis</i>	Applying to PhD programs
76	Joel Brown	2022	BCMB	Molecular recognition within the ES complex: a mechanistic investigation to discern how 6-hydroxynicotinate-3-monoxygenase (NicC) distinguishes between substrate analogues when enhancing its rate of NADH oxidation	Sutra Biopharma, San Francisco; Applying to PhD programs
77	Emilee Haines	2022	BCMB	Advances in characterizing the gene-encoded subunits that compose the nicotinate dehydrogenase and 6-hydroxynicotinate dehydrogenase enzyme complexes within <i>Bacillus niacini</i> nicotinic acid degradation pathway	Applying to PhD programs
78	May Z. Hlaing	2022	BCMB	Investigating substrate specificity for 6-hydroxynicotinate-3-monoxygenase (NicC) with alternative substrates: consequences to catalysis of replacing or removing the ring nitrogen	Biomedical researcher, The James Cancer Center at OSU; MD student, The Ohio State University
79	Sai Kwan Khal	2022	BCMB	Advances in the elucidation of the nicotinic acid degradation pathway in <i>Bacillus niacini</i> : proof of formation of the trihydroxypyridine intermediate and the characterization of an FMN-dependent flavoprotein of unknown function	PhD student, Duke Univ.
80	Omar Kelly	Dec 2022	BCMB	The Influence of Key Residues on Catalytic Activity and Substrate Specificity of Taurocyamine Kinases from <i>Arenicola brasiliensis</i> , An enzyme in the Phosphagen kinases family	M.S. student, Georgia State University
81	Eric Adadevoh	2023	BCMB	Exploring the Binding Multiplicity, Mode of Inhibition and Communication between NADH Binding Sites on 6-Hydroxynicotinate 3-monoxygenase (NicC)	Research position Ruby Biotech, San Francisco; Plans to apply to PhD programs
82	Sam Belsky	2023	BCMB	Interrogation of a conserved overlap between cofactor and substrate binding domains to facilitate crosstalk-induced conformational changes in Class A Flavin Monoxygenases: A case study of 6-Hydroxynicotinate-3-Monoxygenase	PhD student, Univ. Illinois – Urbana Champaign
83	Kira Boyce	2023	BCMB	A CoxG homologue subunit is necessary for the function of <i>Bacillus niacin</i> nicotinate dehydrogenase	PhD student, University of Virginia
84	Takoda Zuehlke	2023	BCMB	Identification of a putative binding mechanism for the reducing substrate of 6-hydroxynicotinate 3-monoxygenase	Applying to PhD programs
	Jack Donahue	2024	BCMB		Applying to medical school
	Grace Gascoigne	2024	BCMB		Applying to medical school
	Abigail Lyon	2024	BCMB		

	Willow Reddish	2024	BCMB		Applying to dental school
	Kath Olson	2024	BCMB		Applying to PhD programs
	Jorge Virto	2024	BCMB		Applying to PhD programs