R. Marshall Werner, Jr.

906-322-2350 wernerro@gvsu.edu

Education Summary

2000	Post-Doc	Biochemistry	NIST/CARB
1998	Ph.D.	Chemistry	University of Maryland College Park
1993	B.S.	Biology	Cornell University

Academic and Administrative Experience Summary

2020-present	Affiliate Professor of Chemistry		
-	Grand Valley State University, Allendale, MI		
2018-2020	Visiting Professor of Chemistry		
	Grand Valley State University, Allendale, MI		
2001-2018	Professor of Chemistry		
	Lake Superior State University, Sault Ste. Marie, MI		
2006	Tenure Awarded, Promoted to Associate Professor		
2012	Promoted to Professor		
2013	Nominated as LSSU Outstanding Professor		
2014	Nominated as LSSU Outstanding Professor		
2011-2013	Chair, School of Physical Sciences		
	Lake Superior State University, Sault Ste. Marie, MI		
2009-2011	Faculty Association President (MEA)		
	Lake Superior State University, Sault Ste. Marie, MI		
2007-2009	Faculty Association Vice President (MEA)		
	Lake Superior State University, Sault Ste. Marie, MI		
2004-2008	Chair, University Internal Animal Care and Use Committee (IACUC)		
	Lake Superior State University, Sault Ste. Marie, MI		
2003-2005	Director, Aquatic Research Laboratory (ARL)		
	Lake Superior State University, Sault Ste. Marie, MI		

Education, Honors, and Professional Activities

Post-Doctoral Research (1998-2000)

-Research with Dr. James T. Stivers on the mechanism of uracil DNA glycosylase (UDG)

 (a DNA repair enzyme) at the Center for Advanced Research in Biotechnology (CARB) and National Institute of Standards and Technology (NIST), 1998-2000.
 -National Institute of Standards and Technology (NIST) post-doctoral fellowship, 1998-2001.

-NIH post-doctoral fellowship, 2000-2001.

Graduate (1993-1998)

-Ph.D. in Bioorganic Chemistry, University of Maryland College Park (UMCP), 1993-1998. Title of thesis: "Mechanistic probes of oligosaccharyltransferase and peptide:Nglycanase."

-Research with Dr. Jeffery T. Davis on the mechanism of N-linked protein glycosylation. -Outstanding undergraduate TA award, 1994, UMCP.

Undergraduate (1989-1993)

-B.S. in Biology (Ecology), Cornell University, 1989-1993. -New York undergraduate research fellow, 1992-1993.

Educational Scholarship and Training

MAGNA Teaching Course entitled "Developing and Teaching an Online Course". Included 20 hours of instruction, certificate awarded July 7, **2020**.

ACUE Course in Effective Teaching Practices; Administered by the Association of College and University Educators. This certificate signifies my completion of a 25-module course in effective teaching practices requiring the implementation of evidence-based instructional approaches. The credential is co-issued by the American Council on Education and distinguishes faculty for their commitment to educational excellence and student success. Certificate awarded June 30, **2020**.

Grants Awarded (Awarded \$1.21 million)

\$7,500 "Investigation of a non-antibody-based treatment for venomous snakebite: Production, purification, and characterization of metalloproteinase inhibitors from the North American opossum *D. virginiana*." Grand Valley State University Summer Scholars S³ Award. May-July **2019**. PI.

\$2,000 "Native American Medicinal Plants: Encouraging STEM Educational Partnerships Through Indigenous Knowledge." Funded by American Chemical Society – Collaborative Opportunities Grant. **August 2017-2018**. Co-PI.

\$399,500 "MRI: Acquisition of a 400 MHz NMR Spectrometer for Use in Research and Research Training." Funded by National Science Foundation – Major Research Instrumentation (NSF-MRI # 1626523). September 2016 - 2019. Co-PI

\$1,000 "Hamilton Syringe Grant." Funded by the Hamilton Syringe Company. **November 2012**. PI.

\$715,300, "Biotic Integrity and Habitat Assessment within the St. Marys River AOC." Funded by USEPA. **Fall 2004-Fall 2007**, Extended to Summer **2008**. PI.

\$24,960, "Thiaminase: New Tools in the Fight Against EMS." Funded by the Great Lakes Fishery Trust. **Fall 2003-Spring 2005**. PI.

\$69,975, "CRIF/RUI: Acquisition of a High Pressure Liquid Chromatograph (HPLC) for Environmental Undergraduate Research and Education." Funded by National Science Foundation – Major Research Instrumentation (NSF-MRI). **Spring 2004-Spring 2007**. Co-PI.

Publications (Undergraduate Students *underlined*)

- 1. Josephine P. Werner, <u>Molly Campbell</u>, and R. Marshall Werner "CRISPR in undergraduate biochemistry laboratory education." *In preparation*.
- R. Marshall Werner, <u>Lauren Miling</u>, <u>Brianna Elliot</u>, <u>Mitchell Hawes</u>, <u>Danielle Webber</u>, and <u>Jennifer</u> <u>Wickens</u>. Bacterial Expression of a Snake Venom Metalloproteinase Inhibitory Protein from the North American Opossum (*D. Virginiana*). Submitted to *Toxicon* Nov. 1, **2020** (Accepted Jan. 20, 2021).
- 3. R. Marshall Werner. "Bacterial expression of a snake venom metalloproteinase inhibitor (SVMPI) found in the North American opossum (*Didelphis virginiana*): Solubility enhancement using a maltose binding protein (MBP) affinity tag." *Toxicon*, **2020**, *182*, s23. DOI: https://doi.org/10.1016/j.toxicon.2020.04.058
- R. Marshall Werner and <u>Austin Johnston</u>. "³¹P NMR of the pyruvate kinase reaction: An undergraduate experiment in enzyme kinetics." *Biochemistry and Molecular Biology Education*, **2017**, 45, 509-514. DOI: 10.1002/bmb.21079
- 5. R. Marshall Werner, Benjamin Southwell and <u>Benjamin Rook</u>. Five year trends in the egg-thiamine status of Atlantic salmon from the St. Marys River, Michigan. *International Journal of Great Lakes Research*, **2011**, *37*, 43-46. DOI: https://doi.org/10.1016/j.jglr.2011.01.001
- Ashley H. Moerke and R. Marshall Werner. Ecological status of the St. Marys River: Foreword. International Journal of Great Lakes Research, 2011, 37, 1-4. DOI: <u>https://doi.org/10.1016/j.jglr.</u> 2011.03.018
- Barbara J. Keller, Richard C. Back, Judy Westrick, R. Marshall Werner, Barbara Evans, Ashley Moerke., Gregory Zimmerman, Derek Wright, <u>Emily Grenfell and Johanna Courneya</u>. Sediment quality at selected sites in the St. Marys River area of concern. *International Journal of Great Lakes Research*, 2011, 37, 12-20. DOI: https://doi.org/10.1016/j.jglr.2011.02.003
- 8. R. Marshall Werner, Ashley Moerke, Greg Zimmerman, Barb Keller, Judy Westrick and Barb Evans. Biotic integrity and habitat assessment within the St. Marys River AOC. Final Report to USEPA. **2008**. EPA Project # GL-96538301-0.
- R. Marshall Werner, <u>Benjamin Rook</u> and Roger Greil. Egg-thiamine status and occurrence of early mortality syndrome (EMS) in Atlantic salmon from the St. Marys River, Michigan. *International Journal of Great Lakes Research*, 2006, 32, 293-305. DOI: https://doi.org/10.3394/0380-1330(2006)32[293:ESAOOE]2.0.CO;2
- R. Marshall Werner and James T. Stivers. Kinetic isotope effect studies of the reaction catalyzed by uracil DNA glycosylase: Evidence for an oxocarbenium ion-uracil anion intermediate. *Biochemistry*, 2000, 39, 14054-14064. DOI: 10.1021/bi001817
- 11. R. Marshall Werner, Yu-Lin Jaing, <u>Russell G. Gordely</u>, G. Jayashree Jagedeesh, Jane E. Ladner, Gaoyi Xiao, Maria Tordova, Gary Gilliland and James T. Stivers. Stressing-out DNA? The contribution of serine-phosphodiester interactions in catalysis by uracil DNA glycosylase. *Biochemistry*, **2000**, *39*, 12585-12594. DOI: 10.1021/bi001532v

- James K. Coward, Tong Xu, Barbara S. Gibbs, R. Marshall Werner and Jeffery T. Davis. Oligosaccharyltransferase: Recent research on catalysis and ligand binding. *FASEB Journal*, **1999**, 13, A1539, suppl. S.
- R. Marshall Werner, Leonard M. Williams and Jeffery T. Davis. The C-glycosyl analog of an Nlinked glycoamino acid. *Tetrahedron Letters*, **1998**, *39*, 9135-9138. DOI: https://doi.org/10.1016/ S0040- 4039(98)02065-6
- Tong Xu, R. Marshall Werner, Jeffery T. Davis and James K. Coward. Synthesis and evaluation of tripeptides containing asparagine analogs as potential substrates or inhibitors of oligosaccharyltransferase. *Journal of Organic Chemistry*, **1998**, *63*, 4767-4778. DOI: 10.1021/ jo9802123
- R. Marshall Werner, <u>Ori Shokek</u> and Jeffery T. Davis. Preparation of 4-oxo-L-norvaline via diazomethane homologation of β-aspartyl aldehyde. *Journal of Organic Chemistry*, **1997**, *62*, 8243-8246. DOI: 10.1021/jo971088a
- 16. R. Marshall Werner, <u>Mike Barwick</u> and Jeffery T. Davis. C-silylation of secondary amides: GlcNAc peracetate derivatives. *Tetrahedron Letters*, **1995**, *36*, 7395-7398. DOI: https://doi.org/10.1016/0040-4039(95)01559-0
- Invited Presentations (Undergraduate authors/presenters <u>underlined</u>)
 - "Bacterial expression of a snake venom metalloproteinase inhibitor (SVMPI) found in the North American opossum (*Didelphis virginiana*): Solubility enhancement using a Maltose Binding Protein affinity tag." R. Marshall Werner. Venom Week, North American Society of Toxinology Bi-annual meeting held at University of Florida in Gainsville, Florida. March 7, **2020**.
 - "A STEM Faculty Learning Community." Tomas Pentecost, R. Marshall Werner, Stephen Rybczynski. Lilly Conference – Traverse City: Advancing Teaching and Learning. October 18, **2019**.
 - "Molecular Biology of snake venom metalloproteinase inhibitors from the North American opossum (*D. Virginiana*): Bacterial expression of recombinant inhibitors as potential anti-venom therapy." R. Marshall Werner. Grand Valley State University CLAS Faculty Research Colloquium, September 13, **2019**.
 - "Lightboard technology in an undergraduate flipped GOB course for allied health majors." R. Marshall Werner. Development in Chemical Education and Educational Research Section (Talk #3201252). American Chemical Society Midwest Regional Meeting, Midland, MI, June 6, **2019**.
 - "DNA Repair: Implications for Evolution, Cancer, and Life." R. Marshall Werner. Aquinas College, March 8, **2019**.
 - "Investigation of the oprin protein from North American opossum (*Didelphis virginiana*) as a potential inhibitor of Western diamondback rattlesnake (*C. atrox*) venom metalloproteinases." R. Marshall Werner. US Army Edgewood Chemical Biological Center, October 20, **2017**.

- "A collaborative undergraduate project: Investigation of the oprin protein from North American opossum (*Didelphis virginiana*) as a potential inhibitor of Western diamondback rattlesnake (*C. atrox*) venom metalloproteinases." R. Marshall Werner. Aquinas College, October 12, **2017**.
- "Adventures in carbon-carbon bond formation: From diazomethane to chiral auxiliaries." R. Marshall Werner. Grand Valley State University, December 8, **2016**.
- "Hands-on NMR activities for undergraduates." R. Marshall Werner. Bi-annual Conference of Chemical Educators (BCCE) National Conference, Grand Valley State University, August 3, **2014**.
- "The use of ³¹P NMR in undergraduate biochemistry classes." R. Marshall Werner. Bi-annual Conference of Chemical Educators (BCCE) National Conference, Pennsylvania State University, July 30, **2012**.
- "Trends in egg-thiamine status of Atlantic salmon from the St. Marys River, Michigan." R. Marshall Werner. Lake Superior State University. Annual Meeting of the Michigan Chapter of the American Fisheries Society, Sault Ste. Marie, MI, March 3-5, **2008**.
- "Patterns of coastal wetland fish communities in the St. Marys River, MI." A. Moerke, M. Werner, <u>H. Potter</u>, B. Keller, B. Evans, J. Westrick, and G. Zimmerman. North American Benthological Society Annual Meeting, Anchorage, AK, June 3-10, **2006**.
- "Mechanistic studies of uracil DNA glycosylase." Northern Michigan University. R. Marshall Werner. Marquette, MI. March 18, **2005**.
- "Thiamine status of St. Marys River (MI) Atlantic salmon and progress on the development of new techniques to study EMS/TDC." R. Marshall Werner, <u>Benjamin Rook</u>. Early Mortality Syndrome Conference. Ann Arbor, MI. September 8-9, **2004**.
- "LSSU's award of a USEPA funded grant for the aquatic research laboratory." R. Marshall Werner. St. Marys River Task Group. Cisler Center, LSSU. July 29, **2004**.
- "Thiaminase: The little enzyme that could change the Great Lakes forever." R. Marshall Werner. Michigan State University. Lansing, MI. June 23, **2004**.
- "Thiaminase: New tools in the fight against EMS in Great Lakes salmonids." R. Marshall Werner. Central Michigan University. Mount Pleasant, MI. April 7, **2003.**
- "Thiaminase: Progress toward a novel fluorescent micro-plate assay." R. Marshall Werner, <u>Michael O'Toole, Benjamin Fuller.</u> American Chemical Society Annual Meeting, Boston, MA. August 18-22, **2002**. Poster Presentation #178.
- "Thiaminase: Progress toward a novel fluorescent micro-plate assay." R. Marshall Werner, <u>Richard Federley</u>. Early Mortality Syndrome Conference. Ann Arbor, MI. June 26, **2002**.
- "Thiaminase: New tools in the fight against EMS in Great Lakes salmonids." R. Marshall Werner. Grand Valley State University. Grand Rapids, MI. March 22, **2002**.

- "Mechanistic studies of uracil DNA glycosylase." R. Marshall Werner. University of Michigan. Ann Arbor, MI. March 21, **2002.**
- "A picture of the transition-state structure of uracil DNA glycosylase. Studies involving kinetic isotope measurements." R. Marshall Werner. University of Maryland College Park, College Park, MD. Jeff Davis and Steve Rokita group meeting. May, **2000**.
- "Probing the reaction mechanism of uracil DNA glycosylase with kinetic isotope effects." R. Marshall Werner. Annual National Institute of Technology and Standards, Biotechnology Division conference. May, **2000**.
- "Probing the Ser-pinch mechanism in base-flipping and catalysis by uracil DNA glycosylase (UDG) using directed mutagenesis and phosphorothioate (Ps) substitutions." R. Marshall Werner, James T. Stivers. American Chemical Society National Meeting in San Francisco, CA. Summer, **2000**. Poster Presentation # 64, Division of Biological Chemistry.
- "Towards determination of the transition-state structure of uracil DNA glycosylase: Substrate synthesis, characterization, and KIE measurements." R. Marshall Werner, James T. Stivers. Gordon Research Conference in Bioorganic Chemistry at Proctor Academy in Andover, NH. Summer, **1999**.
- "Diazomethane homologation of amino acid and peptidyl aldehydes." American Chemical Society Meeting in Las Vegas, Nevada. R. Marshall Werner, Jeffery T. Davis. Summer, **1997**. Oral presentation #390.
- "Choosing a graduate school in chemistry." R. Marshall Werner. American Chemical Society, MARM at Pace University. New York, NY. Summer, **1997**. Special volunteer speaker representing the University of Maryland.
- "Synthesis of methyl ketone tripeptides as mechanistic probes of oligosaccharyltransferase by aldehyde homologation with diazomethane." R. Marshall Werner, Jeffery T. Davis. American Chemical Society National Meeting in Orlando, FL. Summer, **1996**. Oral Presentation # 168.
- "Synthesis of a novel methyl ketone tripeptide as a mechanistic probe for protein Nglycosylation." R. Marshall Werner, Jeffery T. Davis. American Chemical Society, MARM at Villanova University, PA. Summer, **1996**. Oral Presentation # 139.
- "Synthesis and conformation of asparagine linked glycopeptides." R. Marshall Werner, Jeffery T. Davis. American Chemical Society, MARM at University of Maryland Baltimore County, MD. Summer, **1994**. Poster presentation # 241.

Professional Conferences Organized

"Bootcamp for NMR Educators". Sault Ste. Marie, MI. Lake Superior State University. May 22-23, **2011**. A total of 22 scientists attended representing numerous academic institutions and 4 industrial entities. The conference was sponsored by 7 international companies.

Professional Conferences Attended

Venom Week, North American Society of Toxinology Bi-annual meeting held at University of Florida in Gainsville, Florida. March 7, **2020**. "Bacterial expression of a snake venom metalloproteinase inhibitor (SVMPI) found in the North American opossum (*Didelphis virginiana*): Solubility enhancement using a Maltose Binding Protein affinity tag." R. Marshall Werner. (Poster and Invited Talk)

Lilly Conference – Traverse City: Advancing Teaching and Learning. October 18, **2019**. "A STEM Faculty Learning Community." Presented by Tomas Pentecost, R. Marshall Werner, Stephen Rybczynski.

Alan Alda Center for Communicating Science Conference; The Principles: Building Some Basics - Advanced Workshop. Grand Valley State University. July 16, **2019**.

Alan Alda Center for Communicating Science; Connection is a Choice - Introduction Workshop. Grand Valley State University, July 16, **2019**.

American Chemical Society Midwest Regional Meeting, Midland, MI, June 6, **2019**. "Lightboard technology in an undergraduate flipped GOB course for allied health majors." R. Marshall Werner, Development in Chemical Education and Educational Research Section (Talk #3201252).

American Chemical Society Midwest Regional Meeting, Midland, MI, June 6, **2019**. "Progress towards the structure of a bacterially expressed snake venom metalloproteinase inhibitor from the North American opossum (*D. virginiana*)." Lauren Miling, R. Marshall Werner, Chemical Tools for Investigating Biological Systems Section (Poster #3201273).

Teaching and Learning with Technology Symposium, Grand Valley State University. Allendale, MI, May 1, **2019**. "Use of Lightboard videos to reduce cognitive loading." R. Marshall Werner American Chemical Society National Meeting, Washington D.C., August 20, **2017**. Development of a peptide library based on naturally occurring proteins from North American opossum (*Didelphis virginiana*) as potential inhibitors of snake venom metalloproteinases." R. Marshall Werner, <u>Danielle Webber, Jenny Wickens</u>. Organic Chemistry Section (ORGN161, Paper #2742655).

American Chemical Society National Meeting, Washington D.C., August 20, **2017**. "Investigation of the oprin protein from North American opossum (*Didelphis virginiana*) as a potential inhibitor of Western diamondback rattlesnake (*C. atrox*) venom metalloproteinases R. Marshall Werner, Jenny Wickens, Danielle Webber. Medicinal Chemistry Section (MEDI202, Paper #2742570).

American Chemical Society Upper Peninsula Local Section (UPLS) Conference, Northern Michigan University, March 25, **2017**. "Cloning of the oprin gene from the North American opossum (Didelphis virginiana) as a potential inhibitor of Western diamondback rattlesnake (C. atrox) venom metalloproteinases." <u>Danielle Webber, Jenny Wickens</u>, R. Marshall Werner. Poster Presentation #7. <u>Note</u>: Poster won <u>second place</u> in the Undergraduate Poster Competition.

Bi-annual Conference of Chemical Educators (BCCE) National Conference, Grand Valley State University, August , **2014**.

Bi-annual Conference of Chemical Educators (BCCE) National Conference, Pennsylvania State

University, July, 2012.

Center for Workshops in the Chemical Sciences Medicinal Chemistry Workshop. University of Minnesota-Twin Cities in Minneapolis, MN. July 15-20, **2012**.

Bootcamp for NMR Educators. Sault Ste. Marie, MI. Lake Superior State University. May 22-23, **2011**.

Center for Workshops in the Chemical Sciences NMR Workshop, NMR Fundamentals and Applications. Complex Carbohydrate Research Center, University of Georgia, Athens, GA. May 17-22, **2009**.

Argonne Undergraduate research Symposium. Argonne National Laboratories, Argonne, IL, Nov. 2-4, **2006**.

Early Mortality Syndrome Conference. Ann Arbor, MI. September 5-6, 2006.

Early Mortality Syndrome Conference. Ann Arbor, MI. September 22-23, 2005.

Lake Huron Technical Committee, Sault St. Marie, Ontario. July 19-21, 2005.

Early Mortality Syndrome Conference. Ann Arbor, MI. September 8-9, 2004.

Restoration of Native Species Workshop, Ann Arbor, MI. June 21-22, 2004.

USGS - Thiamine Deficiency Complex Conference, Ann Arbor, MI. September 16, 2003.

American Chemical Society Regional Meeting, Michigan Technical University. Houghton, MI. April 11-12, **2003**.

American Chemical Society National Meeting, Boston, MA. August 18-22, 2002. Presented poster entitled, "Thiaminase: Progress Toward a Novel Fluorescent Micro-plate Assay." Early Mortality Syndrome Conference. R. Marshall Werner, <u>Michael O'Toole, Benjamin Fuller.</u>

Early Mortality Syndrome Conference. Ann Arbor, MI. June 25-26, 2002.

International Thiamine Conference, Rutgers University. Newark, NJ. May 17-21, 2002.

American Chemical Society National Meeting. San Francisco, CA. Summer 2000

Gordon Research Conference in Bioorganic Chemistry. Proctor Academy. Andover, NH. Summer, **1999**.

American Chemical Society National Meeting. Las Vegas, NV. Summer, 1997.

American Chemical Society Mid-Atlantic Regional Meeting. Pace University. New York, NY. Summer, **1997**.

American Chemical Society National Meeting. Orlando, FL. Summer, 1996.

American Chemical Society Mid-Atlantic Regional Meeting. Villanova University, PA. Summer, **1996**.

American Chemical Society Mid-Atlantic Regional Meeting. University of Maryland Baltimore County, MD. Summer, **1994**.

Course #	Course Title (lect. hrs, diss. hrs., lab hrs.)	Semesters Taught
CHM230	Intro. to Organic and Biochemistry (3,1,2)	4 semesters, labs
CHM231	Introductory Organic Chemistry (3,1,2)	1 semester lab
CHM232	Introductory Biochemistry (3,1,2)	1 semester, lecture/lab
CHM242	Organic Chemistry for Life Sciences II (3,0,3)	2 semesters, lab
CHM499	Independent Research	2 students
BMS499	Independent Research	2 students

Courses Taught at Grand Valley State University (2018-present)

Courses Taught at Lake Superior State University (2001-2018)

Course #	Course Title (lect. hrs, lab hrs.)	Semesters Taught
CHEM110	Applied Organic and Biochemistry (3,2)	26 semesters
CHEM220	Survey of Organic Chemistry (3,3)	3 semesters
CHEM225	Organic Chemistry I (3,3)	5 semesters
CHEM226	Organic Chemistry II (3,3)	9 semesters
CHEM310	Applied Spectroscopy (3,3)	1 semester
CHEM351	Introductory Biochemistry (3,3)	15 semesters
CHEM452	Adv. Biochem. Mol. Tech. (2,4)	5 semesters
CHEM495	Senior Project (0,2)	Multiple semesters
CH/EV499	Senior Seminar (1,0)	2 semesters
CH/EV 399	Junior Seminar (1,0)	2 semesters
HONR 302	The Chemistry of Mind Altering Drugs (3,0)	1 Semester
HONR 302	DNA: The Secret of Life (3,0)	1 Semester
BIOL220	Introductory Genetics (3,3)	1 Semester (Fall 2015)
BIOL495	Senior Project (0,2)	Multiple semesters

Senior Projects Mentored at Grand Valley State University

Michael Vogt, Winter 2021

"Kinetic characterization of snake venom metalloproteinase inhibitors using a continuous fluorescent peptide assay."

Lauren Miling, Fall 2019

"Investigation of a non-antibody-based treatment for venomous snakebite: Production, purification, and characterization of metalloproteinase inhibitors from the North American opossum D. virginiana."

Senior Projects Mentored at Lake Superior State University

Jason Lepore, Fall 2017

"Synthesis of a fluorescent peptide to determine *C. atrox* metalloproteinase kinetics and inhibition of short oprin-like peptides."

Ryan Renz, Fall 2017

"Solid phase peptide synthesis of short oprin-like peptides as potential inhibitors of *C*. *Atrox* venom metalloproteinases."

Danielle Webber, Spring 2017 "Purification and inhibitor assays of atrolysin metalloproteinases from rattlesnake (C. atrox) venom." Jenny Wickens, Spring 2017 "PCR and protein expression of snake venom metalloproteinase inhibitor oprin from Didelphis virginiana." Jason Nichols, Spring 2017 "Alkylation of Evans chiral auxiliaries to synthesize quaternary chiral centers." Shannon Young, Spring 2017 "Synthesis of chiral auxiliary substrates to probe limitations of the use of chiral oxazolidinones for the synthesis of quaternary stereocenters." Samantha Barna, Fall 2014 "Detection and characterization of synthetic cannabinoids." Shelby Cunningham, Fall 2014 "Detection of opiates in dried blood samples utilizing ELISA" Alyssa Haney, Fall 2013 "Expression and purification of cytochrome oxidase proteins in *E.coli*" (NSF-REU) Alexandra Nisbet, Fall 2013 "Design and purification of fusion vector with Green Fluorescent Protein." Kourtney Swiss, Spring 2013 "Measurement of lead levels in St. Marys River sediments." Jessica Beaudry, Spring 2013 "Detection of vector deposition in blood spatter analysis." Christine Larkin, Fall **2012** "Measurement of CI/LI additive in military jet fuel by infrared spectrometry." (NSF-REU) Ashley Ryckman, (Honors) Fall 2012 "Development of assay techniques to measure protein deposits on contact lenses." Ashley Ryckman, Fall 2012 "Characterization of yellow pigments in freshwater *Flavobacteria*" (NSF-REU) Michael Overbeek, Fall 2012 "Asymmetric synthesis using chiral auxiliaries and titanium enolates." Edward Kramer, Spring 2012 "Development of a novel ¹³C DEPT-Q pulse sequence for the Anasazi NMR platfrom." Peter Bonneau, (Honors) Spring 2009 "The development and application of an ELISA for thiaminase II." Peter Bonneau, Spring 2009 "The development of an ELISA for thiaminase II." Austin Johnston, Fall 2008 "Determination of enzyme kinetics: ³¹P NMR." Alex Mwai, (Honors), Spring 2007 "Genetic analysis of perch from the St. Marys River." Alex Mwai, Fall 2006 "50/50 Superposition of the F2 and F1 hyperfine levels of the 5^2 S $_{1/2}$ energy levels of Rubidium-87 atoms." (NSF-REU) Anthony Bruni, Fall 2005 "Measurement of coenzyme-O10 from vitamin supplement pills." Danielle Pitman, Spring 2005 "Development of and ELISA for bacterial derived thiaminase." Justin McCleod, Spring 2005 "Egg thiamine and early mortality syndrome in Great Lakes basin walleye Sander vitreus."

Benjamin Rook (Honors), Fall 2004 "Rapid reversed-phase solid-phase extraction analysis of egg-thiamine Levels in St. Mary's River Atlantic Salmon (Salmo salar)." Benjamin Rook, Fall 2004 "Relationship of egg-thiamine levels in St. Mary's River Atlantic salmon (Salmo salar) with Atlantic salmon population factors and forage-base population factors." Becca Johnson, Spring 2004 "Purification of thiaminase I for the production of anti-thiaminase antibodies." Richard Federley, Spring 2004 "Assay development and large scale purification of thiaminase." Adam Nanninga, Fall 2003 "Analysis of Procure® in fish tissue." Michael O'Toole (Honors), Spring 2003 "An improved method for isolation of Bacillus thiaminolyticus from alewife." "Purification of thiaminase I From alewife-derived Bacillus thiaminolyticus." Nick Gresick, Spring 2002 "Thiamine deficiency in Atlantic salmon: Analysis of egg-thiamine levels and determination of fry survival rate in response to thiamine treatment."

Administrative Accomplishments

2011-2013 Chair, School of Physical Sciences (Lake Superior State University)

Responsible for the strategic, financial, operational management, and academic programs in the School of Physical Science (Chemistry, Environmental Science, Geology, and Physics). The school has 15 full-time tenure track faculty, 3 part-time faculty, 1 full-time staff, and approximately 175 students (majority full-time traditional). The Chemistry Department is approved by the American Chemical Society (ACS).

Major Accomplishments:

- •Led chemistry faculty in a complete curriculum overhaul to bring 9 degree programs into compliance with ACS Guidelines for degree certification.
- •Oversaw the implementation of ACS certified degrees in Forensic Chemistry and Environmental Science.
- •Saw 50 % increase in program enrollments in Chemistry, Biochemistry, and Forensic Chemistry after changes in ACS curriculum alignment were complete.
- •Successfully hired 5 tenure track faculty.
- •Successfully managed a budget of approximately \$150K/yr with annual surplus.
- •Led geology and physics faculty to incorporate Geographical Information Systems (GIS) courses into curriculum.
- •Implemented the use of ESRI software and associated licenses for GIS laboratories.
- •Led the implementation of hands-on use of new laboratory data capture devices and sensors (Vernier Instruments)
- •Worked with the registrar to update and streamline all degree audits under new ACS guidelines.
- •Led an overhaul of senior thesis and senior project courses in chemistry and environmental science.

2009-2011 Faculty Association President (MEA) (Lake Superior State University)

Responsible for the organization, coordination, and oversight of all activities related to the bargaining unit for the faculty at LSSU as represented by the Michigan Education Association

(MEA). Worked closely with LSSU's President, Provost, and Board of Trustees to implement a variety of initiatives and to resolve disputes.

Major Accomplishments:

- •Led 120 faculty as the head of LSSU's faculty bargaining unit (MEA) through the tenure of 2 university presidents and 3 university provosts.
- •Established a faculty led enrollment initiative in conjunction with the Board of Trustees.
- •Maintained positive relationships between the University Administration and the Board of Trustees.
- •Successfully oversaw positive outcomes in 6 grievance cases.
- •Annually met with all new faculty to discuss role of bargaining unit at LSSU.
- •Implemented an annual Faculty Association picnic and social event.

2007-2009 Faculty Association Vice President (MEA) (Lake Superior State University)

Provided support to the FA president in all matters related to organization, coordination, and oversight of activities related to the bargaining unit for the faculty at LSSU as represented by the Michigan Education Association (MEA). Worked closely with LSSU's President, Provost, and Board of Trustees to implement a variety of initiatives and to resolve disputes.

Major Accomplishments:

- •Led a negotiation team to a successful 3-year contract by working closely with LSSU's administrative team.
- •Oversaw all FA social activities.
- •Fostered positive relationships between the University Administration and the Board of Trustees.

2003-2005 Director, LSSU Aquatic Research Laboratory (ARL)

Responsible for the oversight, budgetary management, and implementation of research projects in conjunction with the Michigan Department of Natural Resources (MIDNR), Michigan Department of Environmental Quality (MIDEQ), and the United States Fish and Wildlife Service (USFWS)

Major Accomplishments:

- •Brought national recognition to the laboratory by receiving and overseeing a \$715K USEPA grant entitled, "Biotic Integrity and Habitat Assessment within the St. Marys River AOC".
- •Worked with LSSU staff and students on numerous research projects related to environmental studies of the St. Marys River and fisheries research.
- •Promoted LSSU through direct interactions with the leaders of the MIDNR, MIDEQ, and USFWS at our annual site inspection.
- •Improved visibility and thus increased donations from alumni and external constituents through the installation of the "ARL Fish CAM".

Negotiation Team, Lake Superior State University Faculty Association (MEA), (2007-2008)

- -Participated in year-long contract negotiations with LSSU administration.
- -3-year contract successfully negotiated.

Chair, University Internal Animal Care and Use Committee (IACUC) (2004-2008)

-Reviewed research proposals involving animals and humans. -Ensured that appropriate NIH/USDA procedures were followed by investigators.

University Curriculum Committee, Faculty Representative (2011-2013)

-Reviewed proposals for LSSU's curriculum committee.

University General Education Committee, Faculty Representative (2005-2007)

-Reviewed and implemented proposals for LSSU's general education requirements.

Faculty Chair, Academic Excellence Scholarship Committee (2015-present)

-Served as chair of committee that annually selects the top student at LSSU and provides a scholarship for their senior year.

Faculty Representative, University NCAA Committee (2001-2008)

-Reviewed NCAA regulations and advised student-athletes to remain academically eligible.

Presidential Search Committee (2013-2014)

-Faculty chair of successful search for former LSSU president, Dr. Thomas Pleger.

Dean of College of Arts and Sciences Search Committee (2015-2016)

-Faculty chair of successful search. Provided 3 candidates to administration for consideration.

Chair, University Grants Committee (2006-2009)

-Served as Chair of faculty review panel.

Chair, University "Vision and Goals" Committee (2002)

-Served as faculty chair to develop mission and vision statements for LSSU.

Chair, School Seminar Committee (2002-2006)

-Coordinated monthly school-wide seminar series. -Invited Seminar Speakers, arranged travel.

University Recruitment and Retention Committee (2003-2005)

-Served as faculty representative to evaluate practices at LSSU.

Faculty Search Committees

- Search Committee for Chemistry Sabbatical Replacement faculty (2018)
- Search Committee for Chemistry faculty (2013)
- Search Committee for Chemistry faculty (2012)
- Search Committee for Business faculty (2010)
- Search Committee for Chemistry faculty (2009)
- Search Committee for Fish Health faculty (2008)
- Search Committee for Chemistry Sabbatical Replacement (2009)
- Search Committee for Biology Fisheries Position (2005)
- Search Committee for Environmental Science Position (2005)
- Search Committee for Biology Fisheries Position (2004)

Community Leadership and Service

Board of Trustees (2003-2005)

-St. Mary's Catholic School, Sault Ste. Marie, MI

Head Boy's Junior Varsity Basketball Coach (2014-2018) -Sault Area High School Boy's Basketball (2014-2018)

Assistant Men's Varsity Basketball Coach (Volunteer) (2000-2007) -Lake Superior State University Men's Basketball team

Men's Varsity Basketball Team Academic Advisor (2000-2007) -Lake Superior State University Men's Basketball team

Assistant Women's Varsity Basketball Coach (Volunteer) (2014-2015)

- Lake Superior State University Women's Basketball team

Chippewa County Science Fair Judge (2003-2006)

-Evaluated student science projects from grades 3-8.

Science Fair Judge Coordinator (2003-2006)

-St. Marys Catholic School.

Music Ministry Coordinator (2001-2005)

-St. Joseph's Catholic Parish, Sault Ste. Marie, MI

Head Girl's Basketball Coach (2003-2013)

-St. Mary's Catholic School, Sault Ste. Marie, MI

Chair, Soo Shootout Basketball Tournament Fundraiser (2013-2018)

-Sault Area High School Boys and Girls Basketball Program

Volunteer Musical Performer (2019-present)

-Lacks Cancer Center, Mercy Hospital, Grand Rapids, MI

Professional Organizations

American Chemical Society, member since 1994

Personal Honors and Interests

-Men's Varsity Basketball, Cornell University. -Coach youth basketball (**2001-2018**). -Eagle Scout, Boy Scouts of America (**1989**).

Professional References (please contact only on request)

Dr. Jeffery T. Davis (Graduate Advisor)

University of Maryland College Park Dept. of Chemistry and Biochemistry College Park, MD 20742 Phone: (301)-405-1845 Email: jdavis@umd.edu

Dr. James T. Stivers (Post-doctoral Advisor)

Johns Hopkins School of Medicine Department of Pharmacology WBSB 314A 725 Wolfe St. Baltimore, MD 21205 Phone: 410-502-2758 Email: jstivers@jhmi.edu

Dr. David M. Myton

Associate Provost and Dean Lake Superior State University 650 W. Easterday Ave. Sault Ste. Marie, MI 49783 Phone: (906)-635-2349 Email: dmyton@lssu.edu

Dr. Robert Adam Mosey (Scientific Collaborator)

School of Science and Medicine, Department of Chemistry Lake Superior State University 650 W. Easterday Ave. Sault Ste. Marie, MI 49783 Phone: (906)-635-2284 Email: rmosey@lssu.edu

Dr. Steve Johnson (Scientific Collaborator)

School of Science and Medicine, Department of Chemistry Lake Superior State University 650 W. Easterday Ave. Sault Ste. Marie, MI 49783 Phone: (906)-635-2160 Email: sjohnson18@lssu.edu