

Elizabeth (Betsy) I. Parkinson

215 Lincoln Street • West Lafayette, IN 47906 • (662) 820-1560 • eparkins@purdue.edu

EDUCATION

Ph.D. in Chemistry with a focus on Chemical Biology, September 2015

University of Illinois at Urbana-Champaign, Urbana, IL

Certificate in Foundations of Teaching, April 2015

Center for Innovation in Teaching and Learning

University of Illinois at Urbana-Champaign, Urbana, IL

B.S. with Honors in Chemistry, May 2010

Rhodes College, Memphis, TN

Graduated *summa cum laude*, American Chemical Society certification

ACADEMIC EXPERIENCE

2018-present

Assistant Professor

Department of Chemistry and Department of Medicinal Chemistry and Molecular Pharmacology, Purdue University, West Lafayette, IN

- Discover novel bioactive natural products and biocatalysts from cryptic biosynthetic gene clusters found in soil dwelling bacteria
- Utilize chemical biology to study mechanisms of bioactive molecules
- Use organic synthesis to make improved bioactive molecules
- Develop targeted anticancer agents (e.g. stapled peptide inhibitors of Nrf2)

2015-2018

NIH Postdoctoral Fellow in Genetics, Microbiology, and Natural Product Biosynthesis

With Professor William W. Metcalf

Department of Microbiology, University of Illinois at Urbana-Champaign, Urbana, IL

- Studied the biosynthetic pathways of phosphonic acid containing natural products in *Streptomyces* species including the potential herbicide fosmidomycin
- Discovered new natural products and their biosynthetic pathways via metabologenomics (a method that correlates biosynthetic gene clusters with specific masses in bacterial extracts)

2010-2015

NSF and ACS Graduate Research Fellow in Chemical Biology and Medicinal Chemistry

With Professor Paul J. Hergenrother

Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL

- Evaluated deoxyxyboquinone (DNQ) as an anticancer agent using in vitro, tissue culture, & murine xenograft models
- Designed, synthesized, and performed biological evaluation of DNQ derivatives
- Evaluated deoxyxybomycin (DNM) as an antibacterial agent
- Designed, synthesized, and performed biological evaluation of DNM derivatives

2007-2010

St. Jude Summer Plus Undergraduate Research Fellow in Molecular Pharmacology

With Doctor Philip M. Potter

Chemical Biology and Therapeutics, St. Jude Children's Research Hospital, Memphis, TN

- Synthesized selective carboxylesterase (CE) inhibitors as potential agents to ameliorate the dose-limiting toxicity of the chemotherapeutic irinotecan
- Evaluated CE inhibitors in vitro and in tissue culture

PUBLICATIONS (Post-Purdue Hire)

12. Eggly, A.; Ogtontseren, N.; Roberts, C.; Alwali, A.; Hennigan, H.; **Parkinson, E.I.*** "A Diels-Alder Probe for Discovery of Natural Products Containing Furan Moieties" Invited publication for the to the "Young Investigators in Natural Products Chemistry, Biosynthesis, and Enzymology" issue of the *Beilstein Journal of Organic Chemistry*. Currently under review. **2024**.

11. Aguilar, C.; Alwali, A.; Mair, M.; Rodriguez-Orduña, L.; Contreras-Peruyero, H.; Modi, R.; Roberts, C.; Sélem-Mojica, N.; Licon-Cassani, C.; **Parkinson, E.I.*** "Actinobacteria Bioprospecting from Ore-Forming Environments" Under review at *Microbial Genomics*. **2024**.

PUBLICATIONS (Post-Purdue Hire, continued)

10. Samal, S.; Nelson, S.; Du, Z.; Wang, D.; Wang, T.; Yang, C.; Deng, Q.; **Parkinson, E.I.**; Mei, J.* "Blood-Catalyzed Polymerization Creates Conductive Polymer in Live Zebrafish" Under review at *J. Am. Chem. Soc.* **2024**.

9. Benton, A.; Terwillinger, E.; Moriarty, N.M.; Liu, B.; Murphy, A.; Maluvac, H.; Shu, M.; Gartenhaus, L.E.; Janson, N.D.; Pfeffer, C.M.; Utturkar, S.M.; **Parkinson, E.I.**, Lanman, N.A.; Hanna, J.A.* "Target gene regulatory network of miR-497 in angiosarcoma" Under review at *Molecular Cancer Research*. **2024**. Preprint on bioRxiv. <https://doi.org/10.1101/2023.09.24.559218>

8. Nelson, S.; Harris, T.J.; Muli, C.S.; Maresch, M.E.; Baker, B.; Smith, C.; Neumann, C.; Trader, D.J.; **Parkinson, E.I.*** "Discovery and Development of Cyclic Peptide Proteasome Stimulators" *ChemBioChem*. **2024**. ASAP. <https://doi.org/10.1002/cbic.202300671>

7. Budimir, Z.L.; Patel, R.S.; Eggly, A.; Evans, C.N.; Rondon-Cordero, H.M.; Adams, J.J.; Das, C.; **Parkinson, E.I.*** "Biocatalytic cyclization of small macrolactams by a PBP-type thioesterase" *Nat. Chem. Biol.* **2024**, 20, 120-128. <https://doi.org/10.1038/s41589-023-01495-z>

Featured in News and Views: *Nat. Chem. Biol.* **2024**, 20, 8-10. <https://doi.org/10.1038/s41589-023-01503-2>

6. Alwali, A.A.; **Parkinson, E.I.*** "Small Molecule Inducers of Actinobacteria Natural Product Biosynthesis" *J. Ind. Microbiol. Biotechnol.* **2023**, 50, kuad019. <https://doi.org/10.1093/jimb/kuad019>

5. Wilbanks, L.E.; Hennigan, H.E.; Martinez-Brokaw, C.D.; Lakkis, H.; Thormann, S.; Eggly, A.S.; Buechel, G.; **Parkinson, E.I.*** "Synthesis of Gamma-Butyrolactone Hormones Enables Understanding of Natural Product Induction" *ACS Chem. Biol.* **2023**, 18, 1624-1631. <https://doi.org/10.1021/acscchembio.3c00241> PMID: 37338162 PMCID: PMC10368014

4. Modi, R.; McKee, N.; Zhang, N.; Alwali, A.; Nelson, S.; Lohar, A.; Ostafe, R.; Zhang, D.D.; **Parkinson, E.I.*** "Stapled Peptides as Direct Inhibitors of Nrf2-sMAF Transcription Factors" *J. Med. Chem.* **2023**, 66, 6184-6192. <https://doi.org/10.1021/acs.jmedchem.2c02037> PMID: 37097833 PMCID: PMC10184664.

3. **Parkinson, E.I.***, Alwali, A.A., Metcalf, W.W.* "An unusual oxidative rearrangement catalyzed by a divergent member of the 2-oxoglutarate dioxygenase superfamily during biosynthesis of the phosphonate natural product Dehydrofosmidomycin" *Angew. Chem. Int. Ed.* **2022**, 61, e202206173. <https://doi.org/10.1002/anie.202206173> PMID: 35588368 PMCID: PMC9296572

2. Hostetler, M.A.; Smith, C.; Nelson, S.; Budimir, Z.; Modi, R.; Woolsey, I.; Frerk, A.; Baker, B.; Gantt, J.; **Parkinson, E.I.*** "Synthetic Natural Product Inspired Cyclic Peptides" *ACS Chem. Biol.* **2021**, 16, 2604-2611. <https://doi.org/10.1021/acscchembio.1c00641>. PMID: 34699170 PMCID: PMC8610019

1. Schorn MA, Verhoeven S, Ridder L, Huber F, Acharya DD, Aksenov AA, Aleti G, Moghaddam JA, Aron AT, Aziz S, Bauermeister A, Bauman KD, Baunach M, Beemelmans C, Beman JM, Berlanga-Clavero MV, Blacutt AA, Bode HB, Boullie A, Brejnrod A, Bugni TS, Calteau A, Cao L, Carrión VJ, Castelo-Branco R, Chanana S, Chase AB, Chevrette MG, Costa-Lotufo LV, Crawford JM, Currie CR, Cuypers B, Dang T, de Rond T, Demko AM, Dittmann E, Du C, Drozd C, Dujardin JC, Dutton RJ, Edlund A, Fewer DP, Garg N, Gauglitz JM, Gentry EC, Gerwick L, Glukhov E, Gross H, Guggenberger M, Guillén Matus DG, Helfrich EJN, Hempel BF, Hur JS, Iorio M, Jensen PR, Kang KB, Kaysser L, Kelleher NL, Kim CS, Kim KH, Koester I, König GM, Leao T, Lee SR, Lee YY, Li X, Little JC, Maloney KN, Männle D, Martin H C, McAvoy AC, Metcalf WW, Mohimani H, Molina-Santiago C, Moore BS, Mullowney MW, Muskat M, Nothias LF, O'Neill EC, **Parkinson EI**, Petras D, Piel J, Pierce EC, Pires K, Reher R, Romero D, Roper MC, Rust M, Saad H, Saenz C, Sanchez LM, Sørensen SJ, Sosio M, Süßmuth RD, Sweeney D, Tahlan K, Thomson RJ, Tobias NJ, Trindade-Silva AE, van Wezel GP, Wang M, Weldon KC, Zhang F, Ziemert N, Duncan KR, Crüseman M, Rogers S, Dorrestein PC, Medema MH, van der Hooft JJJ. "A community resource for paired genomic and metabolomic data mining." *Nat Chem Biol.* **2021**, 17, 363-368. doi: 10.1038/s41589-020-00724-z. PubMed PMID: 33589842.

PUBLICATIONS (Pre-Purdue Hire)

13. Lundberg, A.P.; Boudreau, M.W.; Selting, K.A.; Chatkewitz, L.E.; Samuelson, J.; Francis, J.M.; **Parkinson, E.I.**; Barger, A.M.; Hergenrother, P.J.; Fan, T.M. *Neoplasia*. **2021**, 23, 811-822. <https://doi.org/10.1016/j.neo.2021.06.008>

PUBLICATIONS (Pre-Purdue Hire, continued)

12. Navarro-Muñoz, J.C.; Selem-Mojica, N.; Mallowney, M.W.; Kautsar, S.; Tryon, J.H.; **Parkinson, E.I.**; De Los Santos, E.L.C.; Yeong, M.; Cruz-Morales, P.; Abubucker, S.; Roeters, A.; Lokhorst, W.; Fernandez-Guerra, A.; Cappelini, L.T.D.; Thomson, R.J.; Metcalf, W.W.; Kelleher, N.L.; Barona-Gomez, F.; Medema, M.H, "A computational framework to explore large-scale biosynthetic diversity." *Nat. Chem. Biol.* **2020**, 16, 60. doi: 10.1038/s41589-019-0400-9.

11. **Parkinson, E.I.**; Erb, A.; Eliot, A.C.; Ju, K.S.; Metcalf, W.W. "Fosmidomycin biosynthesis diverges from related phosphonate natural products." *Nat. Chem. Biol.* **2019**, 15, 1049. doi: 10.1038/s41589-019-0343-1.

10. **Parkinson, E.I.**; Goering, A.W.; Tryon, J.H.; Ju, K.; McClure, R.A.; Kembell, J.D.; Zhukovsky, S.; Thomson, R.J.; Kelleher, N.L.; Metcalf, W.W. "Discovery of the Tyrobetaïne Natural Product Family and Their Biosynthesis Using Metabologenomics." *ACS. Chem. Biol.* **2018**, 13,1029. DOI: 10.1021/acscchembio.7b01089

9. Lee, H.Y.; **Parkinson, E.I.**; Granchi, C.; Panigrahy, D.; Seth, P.; Minutolo, F.; Hergenrother, P.J. "Reactive Oxygen Species Synergize to Potently and Selectively Induce Cancer Cell Death". *ACS Chem. Biol.* **2017**, 12, 1416. DOI: 10.1021/acscchembio.7b00015

8. Lundberg, A.P.; Francis, J.M.; Pojaka, M.; **Parkinson, E.I.**; Wycisloc, K.; Rosold, T.J.; Browne, M.E.; Londond, C.A.; Dirikoluf, L.; Hergenrother, P.J.; Fan, T.M. "Pharmacokinetics and derivation of an anticancer dosing regimen for the novel anti-cancer agent isobutyl-deoxyxyboquinone (IB-DNQ) in the domestic felid species." *Invest. New Drugs.* **2017**, 35, 134. DOI:10.1007/s10637-016-0414-z.

7. **Parkinson, E.I.**; Hergenrother, P.J. "Deoxyxyboquinones as Personalized Cancer Therapeutics." *Acc. Chem. Res.* **2015**, 48, 2715. DOI: 10.1021/acs.accounts.5b00365

6. **Parkinson, E.I.**; Bair, J.S.; Nakamura, B.A.; Lee, H.Y.; Kuttab, H.K.; Southgate, E.S.; Lau, G.W.; Hergenrother, P.J. "Deoxyxybomycins Inhibit Mutant DNA Gyrase and Rescue Mice Infected with Fluoroquinolone-Resistant Bacteria." *Nat. Commun.* **2015**, 6, 6947. DOI: 10.1038/ncomms7947

5. Granger, B. A.; Jewett, I, T.; Butler, J. D.; Hua, B.; Knezevic, C. E.; **Parkinson, E.I.**; Hergenrother, P. J.; Martin, S. F "Synthesis of (±)-Actinophyllic Acid and Analogs: Applications of Cascade Reactions and Diverted Total Synthesis." *J. Am. Chem. Soc.* **2013**, 135,12984-12986. DOI: 10.1021/ja4070206

4. **Parkinson, E.I.**; Bair, J.S.; Cismesia, M. Hergenrother, P.J. "Efficient NQO1 Substrates are Potent and Selective Anticancer Agents." *ACS Chem. Biol.* **2013**, 8, 2173-2183, DOI: 10.1021/cb4005832

3. Huang, X.; Dong, Y.; Bey, E.A.; Kilgore, J.A.; Bair, J.S.; Li, L.; Patel, M.; **Parkinson, E.I.**; Wang, Y.; Williams, N.S.; Gao, J.; Hergenrother, P.J.; Boothman, D.A. "An NQO1 Substrate with Potent Antitumor Activity that Selectively Kills by PARP1-Induced Programmed Necrosis." *Cancer Res.* **2012**, 72, 3038-3047, DOI: 10.1158/0008-5472.CAN-11-3135.

2. **Parkinson, E.I.**; Hergenrother, P.J. "Runaway ROS as a Selective Anticancer Strategy." *ChemMedChem.* **2011**, 6, 1957-1959, DOI: 10.1002/cmdc.201100381.

1. **Parkinson, E.I.**; Hatfield, J.M.; Tsurkan, L.; Hyatt, J.L.; Edwards, C.C.; Hicks, L.D.; Yan, B.; Potter, P.M. "Requirements for mammalian carboxylesterase inhibition by substituted ethane-1,2-diones." *Bioorg. Med. Chem.* **2011**, 29, 4635-4643, DOI: 10.1016/j.bmc.2011.06.012.

PATENTS

5. **Parkinson, E.I.**; Hostetler, M.A. Cyclic Peptide Antibiotics Discovered via BiCyCLE (Biologically Inspired Chemically Created Leads). Provisional patent filed March 4, 2021.

4. Hergenrother, P.J.; **Parkinson, E.I.**; Bair, J.S. 2015. Compounds for treatment of fluoroquinolone-resistant bacteria. WO 2015142952 filed Mar. 17, 2015 and issued Sep. 24, 2015.

3. Hergenrother, P. J.; Knezevic, C. E.; **Parkinson, E. I.**; Martin, S. F.; Granger, B. A. 2015. Anticancer Agents. WO 2015006615 filed July 10, 2014 and issued Jan. 15, 2015.

PATENTS (continued)

2. Hergenrother, P.J.; Boothman, D.A.; Bair, J.S.; Cao, L.; Gao, J.; Huang, X.; Luo, X.; Ma, X.; Moore, Z.R.; **Parkinson, E.I.** 2014. Tumor Selective Combination Therapy. WO 2014168991 filed April 8, 2014, issued Oct. 16, 2014.

1. Hergenrother, P.J.; Boothman, D.A.; Bair, J.S.; Palchadhuri, R.; **Parkinson, E.I.** 2013. Preparation of antitumor NAD(P)H quinone oxidoreductase substrates. WO2013056073 filed Oct. 12, 2012 and issued April 18, 2013; CA 2887648 filed Oct. 12, 2012 and issued April 18, 2013; EP 2768308 filed Oct. 12, 2012 and issued Aug. 27, 2014; US 20150011509 filed April 14, 2014 and issued Jan. 8, 2015.

TEACHING EXPERIENCE**Spring 2021, 2023 Instructor, Bioorganic Chemistry (CHM 656)**

Purdue University, West Lafayette, IN (3 lectures a week; 20 students)

- Developed a new course on natural product biosynthetic pathways and biocatalysis; focused on understanding biosynthetic logic and enzyme mechanisms

Spring 2020, 2022, 2024 Co-Instructor, Organic Chemistry I (MCMP 204)

Purdue University, West Lafayette, IN (7 lectures, 235 students in 2020; 14 lectures, 182 students in 2022)

Fall 2018, 2019, 2020, 2021, 2022 Instructor, Organic Chemistry I (CHM 255)

Purdue University, West Lafayette, IN

- 3 lectures a week; 350 students in 2018; 427 students in 2019; 418 students in 2020; 494 students in 2021; 315 in 2022; In 2020 all lectures were taught remotely and asynchronously
- Wrote weekly worksheets, bi-weekly quizzes, and exams to assess student understanding
- Developed weekly Friday Fun Lectures to connect organic chemistry to real world concepts

TRAINING IN TEACHING**Summer 2020 IMPACT-X**

Guides instructors through the major principles of course design

Spring 2017 Educational Organization & Leadership 585: College Teaching (audited)

Profs. Michel Bellini, Cheelan Bo-Linn, Faye Lesht, University of Illinois, Urbana, IL

Spring 2016 Chemistry 590F: Preparing Future Faculty (audited)

Prof. Steven Zimmerman, University of Illinois, Urbana, IL

Summer 2014 Center for Innovation in Teaching and Learning Workshop:

What You Need to Know: Essentials of Effective Teaching

Profs. Lucas Anderson and Sandy Finley, University of Illinois, Urbana, IL

HONORS AND AWARDS**NSF CAREER Award, 2023**

Christian J. Foster Award for outstanding contributions to K-12 science, technology, engineering and math (STEM) education in Indiana, Purdue University, 2023

-Awarded due to my development and implementation of labs for high schools and children's museums

College of Pharmacy Bravo Award, Purdue University, 2022

-Awarded for my efforts towards improving graduate student mental health

College of Science Faculty and Staff Leadership Award, Purdue University, 2021

-Awarded for my efforts towards improving graduate student mental health

Arthur Kelley Undergraduate Teaching Award, Chemistry Department, Purdue University, 2021

-Awarded for my teaching in CHM255 undergraduate organic chemistry

NIH Ruth L. Kirschstein National Research Service Award, F32, 2017-2019**School of Chemical Sciences Graduate Student Teaching Award, UIUC, 2014-2015****UIUC List of Teachers Ranked as Excellent by Their Students, 2014****R.C. Fuson Fellowship, Chemistry Department, UIUC, 2013-2014****ACS Medicinal Chemistry Pre-Doctoral Fellowship, 2013-2014****National Science Foundation Graduate Research Fellow, 2010-2013****Phi Beta Kappa, 2009****William Spandow Scholarship in Chemistry, Rhodes College, 2009****Barry M. Goldwater Scholarship, 2008****Rhodes College Organic Chemistry Award, 2008****Rhodes College First-year Biology Award, 2008****CRC First-year Chemistry Award, Rhodes College, 2007**

LEADERSHIP ROLES AND SERVICE

- May 2021-
Present
- Chair of the Purdue Chemistry Department Committee on Graduate Student Mental Health**
- Founded the committee, which consists of faculty members from each division, staff members, and student representatives
 - Developed flyers and website (<https://www.chem.purdue.edu/health/>) to ensure graduate students are informed about mental health resources in the department
 - Gave a presentation to incoming chemistry and medicinal chemistry and molecular pharmacology graduate students on the importance of mental health and available resources
- Jan 2021-
Present
- Development of a high school laboratory focused on isolation of actinobacteria**
The goal of this laboratory is to inspire rural students to have an interest in science. We have focused on rural students since they are an underrepresented group in science
- Worked with Purdue K-12 Outreach coordinators to develop a high school laboratory focused on students isolating actinobacteria from their own back yard and allowing the students to explore the ability of their bacteria to make new antibiotics.
 - Wrote laboratory procedure and filmed videos of the laboratory for high school teachers to use (<https://www.purdue.edu/science/K12/LabPages/Microbes.html>)
 - To date, we have performed this laboratory with 9 high schools and over 160 high school students
- May 2022-
Present
- Development of a laboratory for children focused on isolation of actinobacteria**
The goal of this laboratory is to inspire rural students to have an interest in science. We have focused on rural students since they are an underrepresented group in science
- Worked with Purdue K-12 Outreach coordinators as well as local children's museums to convert our high school laboratory into one more appropriate for younger students (elementary and middle school) to develop a high school laboratory focused on students isolating actinobacteria from their own back yard and allowing the students to explore the ability of their bacteria to make new antibiotics.
 - Since Fall 2022, we have performed the lab a total of 8 times at 7 locations including 3 children's museum, 2 Boys and Girls club locations, and a public library. In total, over 125 children have participated in these events
 - These events are also an opportunity for my undergraduate and graduate students to learn how to talk to the public about science
- October 2022-
Present
- Faculty Advisor to the Purdue University Notre Dame Student Symposium in Chemistry and Medicinal Chemistry**
- Provide advice to Purdue graduate student committee on organizing the symposium when held at Purdue (first iteration was in Fall 2023).
- December 2020-
March 2022
- Faculty Advisor to the Purdue Graduate Student Symposium Planning Committee**
- Provide advice to the graduate student committee on organizing their session at the 2022 ACS National Meeting (Mother (Nature) knows best: a protein's approach to bonding)
- February 2020
- Superheroes of Science Guest**
- Participant in the Superheroes of Science podcast, a Purdue University College of Science program that highlights STEM content, provides professional development opportunities for science teachers, and delivers learning experiences for students
 - Podcast can be found at https://www.youtube.com/watch?v=PG6yUQse_28
- January 2019-
Present
- Manuscript Reviewer**
ACS Chemical Biology, Nature Chem. Biol.; J. Am. Chem. Soc.; J. Med. Chem.; Proc. Natl. Acad. Sci. and others
- March 2019-
Present
- Grant Review Panel** (NOAA Office of Ocean Exploration and Research, NIH R15, NIH SBIR, NIH DMPA, JGI CSP, and others)

LEADERSHIP ROLES AND SERVICE (continued)

- June 2015-
June 2017 **High Throughput Chemistry and Chemical Biology Gordon Seminar**
Chair for 2017 meeting; Co-chair for 2015 meeting
Colby Sawyer College, New London, NH and Proctor Academy, Andover, NH
- Submitted a NIGMS R13 proposal and solicited donations from industry to fund the meeting
 - Developed the program for the meeting including choosing speakers and poster presenters
 - Led discussion sections for the seminar (Finding Vulnerabilities of Cancer and Malaria, 2015) and the conference (Chemical Probes for Profiling and Perturbation / Selectivity and Dynamics, 2015 and Small Molecule Probes and Drug Candidates, 2017)
- June 2016-
June 2017 **Institute for Genomic Biology Postdoctoral Association**
Co-chair
Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign, Urbana, IL
- Planned and advertised meetings, professional development workshops, and outside speakers
 - Aided in the implementation of a postdoctoral mentoring plan
- May 2017 **The World of Genomics**
Volunteer
The Field Museum of Natural History, Chicago, IL
- Explained drug discovery and the problem of antimicrobial resistance to museum visitors
- November 2015&
November 2016 **Carl R. Woese Institute for Genomic Biology Genome Day**
Volunteer
University of Illinois at Urbana-Champaign, Urbana, IL
- Led an experiment table to educate grade-school aged children about the structure of DNA
 - Led an experiment table to educate children about phylogenetic classification of organisms
- March 2016 **Mining Microbial Genomes Symposium**
Co-Chair
Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign, Urbana, IL
- Recruited presenters for the symposium
 - Led the afternoon session for the symposium
- 2010-
2018 **Encouraging Tomorrow's Chemists**
Co-coordinator, 2012-2013; volunteer, 2010-present
University of Illinois at Urbana-Champaign, Urbana, IL
- Planned and volunteered at chemistry demonstrations for local middle and elementary schools
- 2011-
2015 **Women Chemists Committee Girls Day Camp**
Coordinator, 2012; Station Leader, 2013; volunteer, 2011, 2014-2015
University of Illinois at Urbana-Champaign, Urbana, IL
- Organized a day camp for 90 middle school girls with scientific experiment stations
 - Assisted graduate students in planning experiments for stations
 - Demonstrated the concepts of solubility and chromatography through a t-shirt tie dying station
 - Volunteered at multiple stations including food chemistry and chemistry of art
- 2006-
2010 **Rhodes College Associates of the American Chemical Society**
Vice President, 2009-2010; President, 2008-2009; Outreach Chair, 2006-2008
Rhodes College, Memphis, TN
- Organized the annual Natural Science Picnic for ~200 people
 - Organized outreach activities at underprivileged elementary and middle schools in Memphis

PRESENTATIONS

59. **Department of Chemistry, University of California Santa Cruz, Santa Cruz, CA, November 27, 2023**
Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products
58. **Department of Chemistry, Washington University in St. Louis, St. Louis, MO, Oct. 26, 2023**
Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

PRESENTATIONS (continued)

57. 2023 Joint Midwest and Great Lakes Regional ACS Meeting, St. Louis, MO, Oct. 20, 2023

Discovery and development of cyclic peptides for the modulation of challenging targets

56. Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL, Oct. 5, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

55. Department of Chemistry, Vanderbilt University, Nashville, TN, Sept. 26, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

54. Chemical Biology Initiative, University of Minnesota, Minneapolis, MN, Sept. 21, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

53. Department of Chemistry, University of Wisconsin Madison, Madison, WI, Sept. 12, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

52. Department of Molecular and Cellular Biochemistry, Indiana University, Bloomington, IN, Sept. 1, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

51. Pharmaceutical Sciences Department, University of Kentucky, Lexington, KY, August 29, 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

50. 2023 Natural Products and Bioactive Compounds Gordon Research Conference, Andover, NH, August 3, 2023 (speaker)

Utilizing Biocatalysis and Synthetic Chemistry to Access New Natural Products

49. 2023 Enzymes, Coenzymes, and Metabolic Pathways Gordon Research Conference, Waterville Valley, NH, July 18, 2023 (speaker)

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

48. 28th American Peptide Symposium, Scottsdale, AZ, June 27, 2023 (invited speaker)

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

47. 2023 Mid-Atlantic Graduate Student Symposium (MAGSS), The Ohio State University, Columbus, OH, June 16, 2023 (invited speaker)

Utilizing biocatalysis and synthetic chemistry to access new natural products

46. Canadian Chemistry Conference and Exhibition 2023, Vancouver, Canada, June 8, 2023 (invited speaker)

Utilizing biocatalysis and synthetic chemistry to access new natural products

45. Department of Chemistry and Biochemistry, University of California San Diego, May 15, 2023

Utilizing biocatalysis and synthetic chemistry to access new natural products

44. Department of Biological Sciences, University of Alabama, April 14, 2023

Utilizing biocatalysis and synthetic chemistry to access new natural products

43. 2023 Antimicrobial Resistance (AMR) Conference: Determinants, Dynamics, and Deterrence of Drug Resistance, Purdue University, April 6, 2023

Predicted Cyclic Peptide Natural Products for Antibiotic Discovery

42. 4th International Conference on Natural Product Discovery and Development in the Genomic Era, San Diego, CA, January 2023

Utilizing Biocatalysis and Synthetic Chemistry to Access Cyclic Peptides and Streptomyces hormones for the Discovery of Novel Bioactive Natural Products

41. Department of Chemistry, University of North Carolina at Greensboro, Greensboro, NC, October 13, 2022

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

40. Department of Chemistry and Biochemistry, Purdue University Fort Wayne, Fort Wayne, IN October 7, 2022 (virtual)

PRESENTATIONS (continued)

39. **Department of Chemistry, University of Nevada at Reno, Reno, NV, September 30, 2022**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

38. **PI4D Symposium Research Recap, West Lafayette, IN, September 23, 2022**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

37. **American Chemical Society Fall 2022 Meeting, Chicago, IL, August 2022 (selected talk)**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

36. **2022 Society for Industrial Microbiology and Biotechnology Annual Meeting, San Francisco, CA, August 2022 (invited talk)**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

35. **2022 American Society of Pharmacognosy: Natural Product Solutions to Global Challenges, Charleston, SC, July 2022 (selected talk)**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

34. **Bioorganic Chemistry Gordon Research Conference, Andover, NH, June 2022 (Poster)**

Gamma Butyrolactones as Chemical Inducers of Natural Product Biosynthesis

33. **Natural Products (Meta) Genome Mining, Copenhagen, Denmark, May 2022 (Poster and Short Talk)**

Synthetic Natural Product Inspired Cyclic Peptides

32. **The Hitchhiker's Guide to the Biomolecular Galaxy, May 2022 (Oral)**

Synthetic Natural Product Inspired Cyclic Peptides for Discovery of Bioactive Natural Products and Biocatalysts

31. **Illinois State University Department of Chemistry, Normal, IL, April 22, 2022 (invited speaker)**

Predicted cyclic peptide natural products for bioactive molecule discovery

30. **2021 Society for Industrial Microbiology and Biotechnology Annual Meeting, Austin, TX, August 2021 (invited speaker)**

Predicted cyclic peptide natural products for antibiotic discovery

29. **UC Santa Barbara Chemistry and Biochemistry Colloquium, Virtual, June 2, 2021 (invited speaker)**

Antibiotic Discovery via BICyCLE (Biologically Inspired Chemically Created Leads)

28. **Cinvestav UGA-LANGEBIO, Irapuato, Mexico, Virtual, March 23, 2021 (invited speaker)**

Predicted cyclic peptide natural products for antibiotic discovery

27. **Purdue Center for Cancer Research Discover to Translation Seminar Series, December 9, 2020**

Development of Stapled Peptides as Nrf2/MafG Inhibitors for the Treatment of Cancer

26. **Department of Chemistry, Rhodes College, November 10, 2020**

From Microbes to Medicines (Virtual)

25. **Department of Pharmaceutical Sciences, University of Illinois Chicago, September 23, 2020**

From Microbes to Medicines (Virtual)

24. **Natural Product Discovery and Development in the Genomic Era, Society for Industrial Microbiology, San Diego, CA, January 2020 (poster)**

Discovery of bioactive natural products by inducing biosynthetic gene clusters

23. **Society for Industrial Microbiology and Biotechnology, Washington D.C., July 2019 (invited speaker)**

Convergent evolution and novel chemistry in natural products related to fosmidomycin

22. **American Peptide Symposium, Monterrey, CA, June 2019 (poster, presented by Matthew Hostetler)**

The Design and Synthesis of Novel Peptide Macrocycles Inspired by Bacterial Genome Mining

PRESENTATIONS (continued)

21. Bioorganic Chemistry Gordon Research Conference, Andover, NH, June 2019 (poster)*Discovery of bioactive natural products by inducing biosynthetic gene clusters***20. Biochemistry Seminars, Department of Agriculture, West Lafayette, IN, January 2019 (oral)***From Microbes to Medicines***19. MCMP Departmental Retreat, Turkey Run, IN, October 2018 (oral)***From Microbes to Medicines***18. Drug Discovery Symposium, West Lafayette, IN, September 2018 (oral)***From Microbes to Medicines***17. Natural Product Discovery and Development in the Genomic Era, Society for Industrial Microbiology, Clearwater Beach, FL, January 2018 (poster)***Discovery of the Tyrobetaine Natural Product Family and Their Biosynthesis Using Metabologenomics***16. High Throughput Chemistry and Chemical Biology Gordon Conference and Seminar, Andover, NH, June 2017 (poster)***Discovery of the Tyrobetaine Natural Product Family and Their Biosynthesis Using Metabologenomics***15. Better Cancer Therapy from Redox Biology, Cold Springs Harbor, NY, April 2017 (invited speaker)***Deoxyxyboquinones as NQO1-targeted anticancer compounds***14. Mining Microbial Genomes Annual Symposium, Urbana, IL, January 2017 (oral presentation)***Discovery of the Tyrobetaine Natural Product Family and Their Biosynthesis Using Metabologenomics***13. Mining Microbial Genomes Annual Symposium, Urbana, IL, March 2016 (poster)***Characterization of Phosphonate Production by the Reported Fosmidomycin Producer *Streptomyces lavendulae* strain Fujisawa 8006***12. High Throughput Chemistry and Chemical Biology Gordon Conference and Seminar, New London, NH, June 2015 (poster)***Deoxyxybomycins Inhibit Mutant DNA Gyrase & Rescue Mice Infected with Fluoroquinolone-Resistant Bacteria***11. 2015 Cal Meyers Memorial Organic Chemistry Symposium, Carbondale, IL, April 2015 (oral presentation)***Deoxyxybomycins Inhibit Mutant DNA Gyrase & Rescue Mice Infected with Fluoroquinolone-Resistant Bacteria***10. 248th American Chemical Society National Meeting, San Francisco, CA, August 2014 (oral presentation)***Synthesis and Biological Evaluation of Compounds with Activity against Antibacterial Resistant Bacteria***9. 27th Annual Beak-Pines Organic Area Allerton Conference, Monticello, IL, November 2013 (poster)***Synthesis and Biological Evaluation of Compounds with Activity against Antibacterial Resistant Bacteria***8. Medicinal Chemistry Gordon Conference and Seminar, New London, NH, August 2013 (poster)***Efficient NQO1 Substrates are Potent and Selective Anticancer Agents
(best poster award)***7. High Throughput Chemistry and Chemical Biology Gordon Conference and Seminar, New London, NH, June 2013 (poster for the conference and oral presentation for the seminar)***Efficient NQO1 Substrates are Potent and Selective Anticancer Agents***6. 24th EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics, Dublin, Ireland, November 2012 (poster)***Targeting NQO1 as a Potential Anticancer Strategy Using the Small Molecule Deoxyxyboquinone***5. Cancer Community at Illinois Symposium, Urbana, IL, April 2012 (poster)***Targeting NQO1 as a Potential Anticancer Strategy Using the Small Molecule Deoxyxyboquinone*

PRESENTATIONS (continued)

4. University of Illinois Cancer Center Research Forum, Chicago, IL, March 2012 (poster)

Targeting NQO1 as a Potential Anticancer Strategy Using the Small Molecule Deoxyxyboquinone
(best student poster award)

3. 239th American Chemical Society National Meeting, San Francisco, CA, March 2010 (poster)

Synthesis and Biological Evaluation of Benzil Based Carboxylesterase Inhibitors

2. AACR/ACS Chemistry in Cancer Research: A Vital Partnership in Cancer Drug Discovery and Development, New Orleans, LA, February 2009 (poster)

Benzil-based Inhibitors of Carboxylesterases

1. Rhodes College Undergraduate Research and Creative Activity Symposium, Memphis, TN, April 2008 (oral presentation) *Benzil-based Inhibitors for Carboxylesterases***CURRENT GRANTS**

Maximizing Investigators' Research Award 1R35GM138002-01

Title: Mining Cryptic Biosynthetic Gene Clusters for Novel Bioactive Compounds

07/01/2020 – 05/31/2025

Role: PI; Total Sponsor Award: \$1,852,360 (\$1,250,000 direct cost)

Instrument Supplement: \$101,000 for purchase of an UPLC-HRMS

Herman Frasch Foundation Grant, American Chemical Society

Title: Streptomyces Hormones as Quorum Sensing Inhibitors for Phytopathogens

07/01/2022 – 06/30/2027

Role: PI; Total Sponsor Award: \$250,000

Joint Genome Institute, Department of Energy

Title: Evaluation of the Gamma-Butyrolactone Repressors of Streptomyces Natural Product Biosynthetic Gene Clusters

07/01/2022 start date

Role: PI; This grant does not have a monetary amount. Instead, they provide synthesized DNA (2200 constructs, 467 KB total) and DAP-seq services

National Science Foundation (CHE 2236897)

Title: CAREER: A Multidisciplinary Approach for the Discovery and Characterization of Hormone Inducers of Natural Product Biosynthetic Gene Clusters

02/01/2023-01/31/2028

Role: PI; Total Sponsor Award: \$759,423.00

COMPLETED GRANTS

Ralph W. and Grace M. Showalter Research Trust

Title: Discovery of Bioactive Natural Products by Inducing Biosynthetic Gene Clusters

07/01/19-06/30/20

Role: PI; Total Sponsor Award: \$75,000 (\$60,000 direct cost)

Robbers New Investigator Award

Title: Development of Stapled Peptides as Nrf2 MafG Inhibitors for the Treatment of Cancer

07/01/2020-07/01/2021

Role: PI; Total Sponsor Award: \$30,000 direct cost

PIDD Institutional Programmatic Areas

Title: The seeds of destruction: Identification of dominant interfering SARS-CoV-2 peptides for the development of new antiviral drugs

2021-2021

Role: Co-PI with Prof. Doug LaCount and Prof. Richard Kuhn;

Total Sponsor Award: \$50,000 direct cost (Parkinson Lab: \$15,000)