

SHANEN M. SHERRER

Associate Professor · Department of Chemistry and Biochemistry · St. Mary's College of Maryland · 225 Goodpaster Hall
· 18952 E. Fisher Rd. · St. Mary's City, MD 20686 · (240) 895-4351 (office) · smsherrer@smcm.edu

EDUCATION

- Ph.D. in Biochemistry from The Ohio State University 06/2005-08/2011
- Advisor: Dr. Zucai Suo
- B.S. in Biochemistry and Minor in Statistical Methods from Miami University, OH 08/2001-05/2005
- Advisor: Dr. Ann Hagerman
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HONORS AND AWARDS (Selected)

- American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowship (STPF) 08/2023-present
- Council of Public Liberal Arts Colleges (COPLAC) Summer Institute Professional Development Award 06/2022
- American Society for Biochemistry and Molecular Biology (ASBMB) Early Career Faculty Award 04/2021
- American Chemical Society (ACS) North Carolina Local Section Poster Award 09/2016
- American Cancer Society Postdoctoral Fellowship 02/2014-02/2017
- American Heart Association (AHA) Predoctoral Fellowship 07/2009-06/2011
- NIH Chemistry-Biology Interface Training Program Fellowship 10/2008-06/2009
- Robert H. Edgerley Environmental Toxicology Summer Fellowship 07/2008-09/2008
- The Ohio State Biochemistry Program Fellowship 07/2005-09/2006
- Glenn-Stokes Scholar (Ohio Science and Engineering Alliance) 08/2004-05/2005
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RESEARCH EXPERIENCE (Selected)

- St. Mary's College of Maryland (SMCM), St. Mary's City, MD
- Associate Professor of Biochemistry with tenure 08/2023-present
 - *On leave of absence* 09/2023-present
 - Assistant Professor of Biochemistry 08/2017-07/2023
 - Research focus: Determining biochemical and molecular properties of DNA mismatch repair during cross-talk with other DNA processing systems.
- Duke University, Durham, NC
- Postdoctoral researcher in laboratory of Howard Hughes Medical Institute (HHMI) Investigator Dr. Paul Modrich 10/2011-07/2017
 - Research focus: Determined biochemical and molecular properties of the DNA mismatch repair system in humans.
- The Ohio State University, Columbus, OH
- Graduate student researcher in Dr. Zucai Suo's laboratory 05/2006-08/2011
 - Research focus: Determined a minimal kinetic lesion bypass mechanism utilized by Y-family *Sulfolobus solfataricus* DNA Polymerase IV (Dpo4) and mutagenic outcomes of various DNA lesion bypasses catalyzed by the four human Y-family DNA polymerases.
- National Science Foundation (NSF) Research Experiences for Undergraduates program, 05/2003-07/2003

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Bowling Green State University, OH

- Undergraduate student researcher in Dr. Scott Rogers' laboratory
 - Research focus: Identified microbes that were dormant in 10,000 to 400,000 year-old ice cores from Greenland and Antarctica.

Miami University, Oxford, OH

08/2002-05/2005

- Undergraduate student researcher in Dr. Ann Hagerman's laboratory
 - Research focus: Investigated the antioxidant potential in various compounds extracted from plants. Also investigated the role of exercise in oxidative stress for rats by monitoring levels of certain biomarkers.

TEACHING EXPERIENCES (Selected)

Instructor at SMCM, St. Mary's City, MD

08/2017-08/2023

- Courses: CHEM 493/494 *St. Mary's Project*, CHEM 426 *Advanced Biochemistry Laboratory*, CHEM 425 *Biochemistry II*, CHEM 420 *Biochemistry I*, CHEM 420L *Biochemistry I Laboratory*, CHEM 399 *Independent Study*, CHEM 398 *Off-Campus Internship*, MRNE 365 *Marine Environmental Toxicology*, CHEM 197/297/397 *Directed Research*, CHEM 109 *Emerging Scholars Program*, CHEM 106 *General Chemistry II*, and CHEM 106L *General Chemistry II Laboratory*
- Special Course: American Chemical Society (ACS) Laboratory Skills Short Course at SMCM 12/2021
- Guest Lecture for CHM 147 *Introductory Seminar – Chemistry/Biochemistry* in the Department of Chemistry and Biochemistry at Miami University 10/2021
- Guest Lecture for COSC 401 *Software Startup Simulator Capstone* 09/2020

Instructor for the Sisters of Nia Girls' Summer Enrichment Camp, Atlanta, GA

06/2015

- Class: *Protein Science for Young Scholars*
 - Designed and executed curriculum for summer camp of middle school students

Teaching Assistant for the Department of Biochemistry, The Ohio State University, Columbus, OH

09/2006-03/2007

- Class: Biochemistry 511 *Introduction to Biological Chemistry*
 - Head teaching assistant. Organized grading of coursework and exams, and proctored exams.
- Class: Biochemistry 521 *Introduction to Biological Chemistry: Laboratory*
 - Graded coursework, laboratory reports, and exams. Facilitated laboratory sections and proctored exams.

PROFESSIONAL ACTIVITIES AND AFFILIATIONS (Selected)

Moderator for an NIH-NCI Sponsored Session of the 2024 American Association for Cancer Research (AACR) Annual Meeting in San Diego, CA

04/2024

AAAS STPF within National Institutes of Health (NIH) Office of the Director (OD)

08/2023-present

- On detail within National Cancer Institute Division of Cancer Prevention (DCP)

RCSB Protein Data Bank Training, Outreach, and Education Working Group

06/2022-present

Vice President of Academic Affairs and Dean of Faculty Search Committee

06/2022-12/2022

Board of Trustees faculty delegate

06/2021-07/2023

- Finance, Investment, and Audit Committee

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Marine Science Steering Committee	05/2021-05/2024
Developer and webmaster for https://academicequity.smcm.edu/home	05/2020-present
Co-Chair and presider of symposia during the ACS 2021 Spring Annual Meeting	07/2019-04/2021
<ul style="list-style-type: none">Title: <i>Becoming a Chemist: Integrating Professional Skills into Undergraduate Curricula</i>	
Co-Advisor for Biomolecular Organization of St. Mary's Students (ASBMB Student Chapter)	05/2019-08/2023
Natural Science & Mathematics Colloquium Committee	06/2018-05/2020
<ul style="list-style-type: none">Organized itineraries, and hosted chemistry and biochemistry guest speakers.	
Panelist for NIH Career Symposium	05/2018, 05/2021-2024
ASBMB member	01/2017-present
AAAS member	04/2009-present
Ohio State Biochemistry Program recruitment committee	02/2007-08/2011
Howard Hughes Medical Institute (HHMI) Summer Research Internship, Miami University, OH	06/2004-08/2004
Women in Math, Science, and Engineering Advisory Council, Miami University	08/2001-05/2005

PUBLICATIONS & PRESENTATIONS (Undergraduate students, *Corresponding Author)

I. Peer-Reviewed Publications

- Mertz, P.S., **Sherrer, S.M.**, and Bowers, G.M. (2023) Teaching and assessing undergraduate collaboration skills scaffolded through the biochemistry curriculum using collaboration rubrics and student learning contracts. *Biochem Mol Biol Educ* **51** (5), 499 – 507.
- Sherrer, S.M.*** (2020) Using Scientific Poster Presentations to Scaffold Professional Communication Skill Experiences into Biochemistry Courses, In *Integrating Professional Skills into Undergraduate Chemistry Curricula*. Neiles, K.Y., Mertz, P.S., and Fair, J.D. (Eds). ACS Symposium Book Series **1365**, 165 – 178.
- Sherrer, S.M.*** (2020) A virtual laboratory module exploring photosynthesis during COVID-19. *Biochem Mol Biol Educ* **48**, 659 – 661.
- Malisch, J.L.*, Harris, B.N., **Sherrer, S.M.**, Lewis, K.A., Shepherd, S.L., McCarthy, P.C., Spott, J.L., Karam, E.P., Moustaid-Moussa, N., Calarco, J.M., Ramalingam, L., Talley, A.E., Cañas-Carrell, J.E., Ardon-Dryer, K., Weiser, D.A., Bernal, X.E., and Deitloff, J. (2020) In the wake of COVID-19, academia needs new solutions to ensure gender equity. *PNAS* **117**, 15378 – 15381.
- Sherrer, S.M.**, Penland, E., and Modrich, P.* (2018) The mutagen and carcinogen cadmium is a high-affinity inhibitor of the zinc-dependent MutL α endonuclease. *PNAS* **115**, 7314 – 7319.
- Taggart, D.J., Camerlengo, T.L., Harrison, J.K., **Sherrer, S.M.**, Kshetry, A.K., Taylor, J.S., Huang, K., and Suo, Z.* (2013) A High-Throughput and Quantitative Method to Assess the Mutagenic Potential of Translesion DNA Synthesis. *Nucleic Acids Res* **41**, e96.
- Sherrer, S.M.**, Taggart, D.J., Pack, L.R., Malik, C.K., Basu, A.K., and Suo, Z.* (2012) Quantitative analysis of the mutagenic potential of 1-aminopyrene-DNA adduct bypass catalyzed by Y-family DNA polymerases. *Mutat Res* **737**, 25 – 33.
- Sherrer, S.M.**, Maxwell, B.A., Pack, L.R., Fiala, K.A., Fowler, J.D., Zhang, J., and Suo, Z.* (2012) Identification of an Unfolding Intermediate for a DNA Lesion Bypass Polymerase. *Chem Res Tox* **25**, 1531 – 40.
- Sherrer, S.M.**, Sanman, L.E., Xia, C.X., Bolin, E.R., Malik, C.K., Efthimiopoulos, G., Basu, A.K., and Suo, Z.* (2012) Kinetic Analysis of the Bypass of a Bulky Lesion Catalyzed by Human Y-family DNA

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Polymerases. *Chem Res Tox* **25**, 730 – 40.

10. Song, Q., **Sherrer, S.M.**, Suo, Z., and Taylor, J.S.* (2012) Preparation of a site-specific T=^mCG cis-syn cyclobutane dimer-containing template and its error-free bypass by yeast and human polymerase eta. *J Biol Chem* **287**, 8021 – 8.
11. **Sherrer, S.M.**, Fiala, K.A., Fowler, J.D., Newmister, S.A., Pryor, J., and Suo, Z.* (2011) Quantitative Analysis of the Efficiency and Mutagenic Spectra of Abasic Lesion Bypass Catalyzed by Human Y-Family DNA Polymerases. *Nucleic Acids Res* **39**, 609 – 622.
12. **Sherrer, S.M.**, Beyer, D.C., Xia, C.X., Fowler, J.D., and Suo, Z.* (2010) Kinetic basis of sugar selection by a Y-family DNA polymerase from *Sulfolobus solfataricus* P2. *Biochemistry* **49**, 10179 – 10186.
13. Brown, J.A., Pack, L.R., **Sherrer, S.M.**, Kshetry, A., Newmister, S.A., Fowler, J.D., Taylor, J.S., and Suo, Z.* (2010) Identification of Critical Residues for the Tight Binding of Both Correct and Incorrect Nucleotides to Human DNA Polymerase λ . *J Mol Biol* **403**, 505 – 515.
14. Brown, J.A., Zhang, L., **Sherrer, S.M.**, Taylor, J.S.A., Burgers, P.M.J., and Suo, Z.* (2010) Pre-Steady State Kinetic Analysis of Truncated and Full-Length *Saccharomyces cerevisiae* DNA Polymerase Eta. *J Nucleic Acids*, pii: 871939. doi:10.4061/2010/871939.
15. Brown, J.A., Fiala, K.A., Fowler, J.D., **Sherrer, S.M.**, Newmister, S.A., Duym, W.W., and Suo, Z.* (2010) A Novel Mechanism of Sugar Selection Utilized by a Human X-family DNA Polymerase. *J Mol Biol* **395**, 282 – 290.
16. **Sherrer, S.M.**, Brown, J.A., Pack, L.R., Jasti, V.P., Fowler, J.D., Basu, A.K., and Suo, Z.* (2009) Mechanistic Studies of the Bypass of a Bulky Single-Base Lesion Catalyzed by a Y-Family DNA Polymerase. *J Biol Chem* **284**, 6379 – 6388.
17. Fiala, K.A., **Sherrer, S.M.**, Brown, J.A., and Suo, Z.* (2008) Mechanistic Consequences of Temperature on DNA Polymerization Catalyzed by a Y-family DNA Polymerase. *Nucleic Acids Res* **36**, 1990 – 2001.

II. Invited Talks (Selected out of 13)

1. **Shanen M. Sherrer**. A Biochemical Investigation on the Effects of Common Herbicides on Drug Metabolism. (2022) School of Science, Technology, Accessibility, Mathematics and Public Health, Gallaudet University, Washington, DC.
2. **Shanen M. Sherrer**. Keynote Address: The Importance of Research in Preparing for STEM Careers. (2021) 3rd Annual Student Research Symposium, Quest Student Research Institute, VA.
3. **Shanen M. Sherrer**. Genomic Consequences of Non-Lethal Doses of Cadmium. (2020) Department of Chemistry, Amherst College, MA.
4. **Shanen M. Sherrer**. Cadmium Disruption of Human DNA Mismatch Repair. (2019) Chesapeake Biological Laboratory seminar series, University of Maryland Center for Environmental Science, MD.
5. **Shanen M. Sherrer**. Cadmium Targeting of an Endonuclease Leads to Human Mismatch Repair Inhibition. (2018) Department of Biology, Ursinus College, PA.
6. **Shanen M. Sherrer**. A View of Big Data in Biomedical Research. (2013) BDPA Triangle monthly meeting in Research Triangle Park, NC.
7. **Shanen M. Sherrer**. Keynote Address: The Importance of Research as an Undergraduate Scholar. (2010) The 16th Annual Miami University Undergraduate Research Forum, OH.

III. Presentations (Selected out of 76. Authors italicized are the presenters)

1. *Kyle D. Murphy* and **Shanen M. Sherrer***. A Biochemical Investigation on the Structural Integrity of Bovine Serum Albumin During Exposure to Plastic Particles. San Antonio, TX (2024) ASBMB Annual Meeting. (poster)
2. *Gabriela Miranda* and **Shanen M. Sherrer***. Biochemical Investigation on the Structural Consequences of Tandem Mutations Induced by the UV and Cadmium Exposure during DNA Replication. San Antonio, TX (2024) ASBMB Annual Meeting. (poster)
3. *Emily Davis**, **Shanen M. Sherrer**, and *Dominiqua M. Griffin*. Creating and Maintaining Your Professional Network in STEM. Rockville, MD (2024) 9th Annual Maryland Collegiate STEM Conference. (joint oral

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presentation)

4. **Shanen M. Sherrer***, *Jessica Faupel-Badger*, and *Brandy Heckman-Stoddard*. NCI Division of Cancer Prevention Research Resources, Funding Opportunities, and Research Workforce Activities. San Diego, CA (2024) AACR Annual Meeting. (panel presentation)
5. **Shanen M. Sherrer***. Development of a Bioinformatics Tool for Exploring Protein-Metal Interactions via Circular Dichroism Spectroscopy. Seattle, WA. (2023) ASBMB Annual Meeting. (poster)
6. *Gabriella M. De Leonibus* and **Shanen M. Sherrer***. Elucidation of the Mutagenic Threshold Amount of Cadmium Exposure. Arlington, VA. (2022) Sigma Xi International Forum on Research Excellence. (poster)
7. **Shanen M. Sherrer***. A New Opportunity in Maryland to Earn a Bachelor of Science in Marine Science. Arnold, MD. (2022) 7th Annual Maryland Collegiate STEM Conference. (oral presentation)
8. *Jacob B. Wellek* and **Shanen M. Sherrer***. Analysis of *Crassostrea Virginica* Protein Metal Complexes after Exposure to Toxic Environmental Pollutant Cadmium. Philadelphia, PA. (2022) ASBMB Annual Meeting. (poster)
9. **Shanen M. Sherrer*** and *Amber E. Douglass*. Biochemical Investigation into Cadmium-Induced Diminished Function of a Thermal Stable DNA Polymerase. virtual (2021) ASBMB Annual Meeting. (poster)
10. **Shanen M. Sherrer***. Publish or Perish: Using Research Scenarios to Connect Biochemistry Concepts. virtual (2020) Council on Undergraduate Research Virtual Biennial Conference. (poster)
11. *Madeleine Beaulieu*, *Kelly Healy*, *Elizabeth Hill*, *Linnea Lundh*, and **Shanen Sherrer**. *Taq* Attack: Isolation, Purification and Characterization of *Taq* DNA Polymerase I. University of Maryland Baltimore County, Baltimore, MD. (2018) Undergraduate Research Symposium in the Chemical and Biological Sciences. (poster)
12. **Shanen M. Sherrer***. Cadmium Targeting of MutL α Endonuclease Leads to Human Mismatch Repair Inhibition. Salt Lake City, UT. (2016) American Cancer Society Jiler Professors & Fellows Conference. (poster)
13. **Shanen M. Sherrer**, *Jessica A. Brown*, *Lindsey R. Pack*, *Vijay P. Jasti*, *Jason D. Fowler*, *Ashis K. Basu* and *Zucaï Suo**. Mechanistic Studies of the Bypass of a Bulky Single-Base Lesion Catalyzed by a Y-Family DNA polymerase. University of New England, ME. (2009) Gordon Research Conference on Nucleic Acids. (poster)
14. **Shanen Sherrer** and *Ann Hagerman**. Polymeric Polyphenols as Dietary Antioxidants. San Diego, CA. (2005) American Society for Biochemistry and Molecular Biology Annual Meeting. (poster)
15. **Shanen Sherrer**, *Amy Krans*, *Jenni Hoehn*, and *Dr. Scott Rogers**. Life in Ancient Ice. Bowling Green State University, OH. (2003) REU/NSF Summer Conference. (poster and oral presentation)