

Hunter M^cFall-Boegeman

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Education

- 2022 *Ph.D.*, Chemistry, **Michigan State University**, East Lansing, MI (3.95/4.00)
Certification in College Teaching
- 2016 *B.A.*, Biochemistry, **University of Minnesota-Morris**, Morris, MN (3.51/4.00)
ACS Certified Degree

Teaching Experience

- 2023-Present Assistant Professor, Department of Natural Sciences,
Northwest Missouri State University, Maryville, MO
Courses: General Chemistry I Laboratory (CHEM24115), Elementary Biochemistry
(CHEM24362), Elementary Biochemistry Laboratory (CHEM24363), Protein Chemistry
(CHEM24520), General Biochemistry (CHEM24562), General Biochemistry Laboratory
(CHEM24563)
- 2022-2023 Assistant Professor of Chemistry, Division of Science and Mathematics,
University of Minnesota-Morris, Morris, MN
Courses: General Chemistry II Lab (CHEM1102) Organic Chemistry I
(CHEM2301), Organic Chemistry II (CHEM2302) Organic
Chemistry Laboratory (CHEM2311), Introduction to Research I (CHEM2321),
Introduction to Research II (CHEM2322)
- 2021-2022 Instructor, Department of Chemistry, Michigan State University, East Lansing, MI
Courses: Organic Chemistry I (CEM251), Survey of Organic Chemistry (CEM143)
- 2016-2022 Graduate Teaching Assistant, Department of Chemistry,
Michigan State University, East Lansing, MI
Courses: Chemistry Laboratory I (CEM161), Chemistry Laboratory II
(CEM162), Organic Chemistry I (CEM251),
Organic Chemistry II (CEM252), Organic Chemistry Laboratory
(CEM255)
- 2016 Peer Assisted Learning Tutor, Department of Science and
Mathematics, University of Minnesota-Morris, Morris, MN
Course: General Chemistry II (CHEM 1102)
- 2015 Laboratory Teaching Assistant, Department of Science and
Mathematics, University of Minnesota-Morris, Morris, MN
Course: Organic Chemistry Lab I (CHEM2311)

Research Experience

- 2022-Present Independent Research Career
Projects: Vaccine development against tick borne pathogens, Antibody glycan remodeling, and discipline-based education research on teaching organic and biochemistry
- 2020-2022 Graduate Research Assistant, Department of Chemistry,
Michigan State University, East Lansing, MI
Principal Investigator: Melanie M. Cooper, Ph.D.
Project: Incorporation of green and sustainable chemistry into undergraduate organic chemistry lab curricula
- 2016-2022 Graduate Research Assistant, Department of Chemistry,
Institute for Quantitative Health Science and Engineering
Michigan State University, East Lansing, MI
Principal Investigator: Xuefei Huang, Ph.D.
Projects: Synthesis of tumor associated carbohydrate antigens, polymer synthesis, immunological evaluation of virus-like particle and polymer-based conjugate vaccines against cancer, Alzheimer's disease, and Cholera
- 2015 Research Intern, ATRA LLC, St. Anthony, MN
Principal Investigator: Garret Lee, Ph.D.
Project: Formulation and analytical testing of UV-curable inks for industrial inkjet printers
- 2015 Undergraduate Research Assistant, Department of Science and
Mathematics, University of Minnesota-Morris, Morris, MN
Principal Investigator: Nancy Carpenter, Ph.D.
Project: Investigation of solvent effects on allyl indium-based reactions
- 2014 Undergraduate Research Assistant, Department of Science and
Mathematics, University of Minnesota-Morris, Morris, MN
Principal Investigator: Ted Pappenfus, Ph.D.
Project: Synthesis of thermally curable electron donors for use in printable organic photovoltaic devices
- 2014 Undergraduate Research Assistant, Department of Science and
Mathematics, University of Minnesota-Morris, Morris, MN
Principal Investigator: Breeyawn N. Lybbert, Ph.D.
Project: Development of an undergraduate organic lab activity using essential oils to teach separation techniques

Research Funding

- 2023 University of Minnesota-Morris, Faculty Research Enhancement Funds
Title: On Capillary Enzymatic Remodeling of Antibody Glycans
PI: Hunter McFall-Boegeman (02/01/2023-05/15/2023) Award Amount: \$992.65 (Category II)

Honors and Distinctions

2022	Alumni Leadership Spartan Cornerstone Scholarship, Department of Chemistry, Michigan State University
2022	Conference Grant, Council of Graduate Students, Michigan State University
2022	Travel Grant, American Chemical Society Michigan State University Local Section
2022	Dissertation Completion Fellowship, Michigan State University
2021-2022	Future Academic Scholars in Teaching Fellow, Michigan State University
2021	Colleges Online Learning Academy Fellowship, Michigan State University
2021	Graduate Office Fellowship, Graduate School, Michigan State University
2020	Graduate Office Fellowship, Graduate School, Michigan State University
2018	2018 Aitch Graduate Fellow, The Aitch Foundation
2016	Recruiting Fellowship, Department of Chemistry, Michigan State University
2016	Poster Recognized for Contribution by an Undergraduate to Chemical Education Research by the American Chemical Society Committee on Education, 251 st American Chemical Society National Meeting & Exposition

Professional Memberships

2015-Present	American Chemistry Society, Member Carbohydrate Division (CARB) Division of Chemical Education (DivCHED)
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Professional Activities

2023-Present	Reviewer for Journal of Nanobiotechnology, Nanoscience & Nanotechnology-Asia
2022	American Chemistry Society Carbohydrate Division Division Representative for Division Row at the 2022 ACS Spring National Meeting and Exposition
2021-2022	Michigan State University Department of Chemistry Undergraduate Affairs Committee 2021-2022
2016-2022	Michigan State University Council of Graduate Students Parliamentarian 2020-2022 Disciplinary Leadership Award Committee Member 2021-2022 Constitution and Bylaws Committee Chair 2020-2022 Re-Opening Sub-Committee on Research Member 2020 Recording Secretary 2019-2020 Graduate Academic Conference Committee Chair 2019-2020 Outstanding Faculty Mentor Award Committee Member 2019 Department of Chemistry Representative 2016-2019 Graduate Academic Conference Committee Member 2016-2019

Publications

Shaw, V.; Sungsuwan, S.; **McFall-Boegeman, H.**; Huang, Jin, X. Alternative Assembly of Q β Virus-Like Particles. *BioRxiv* **2022** DOI: [10.1101/2022.01.23.477406](https://doi.org/10.1101/2022.01.23.477406) (In Preparation)

Day, E. L.; Petritis, S. J.; **McFall-Boegeman, H.**; Starkie, J. L.; Zhang, M.; Cooper, M. M. A Framework for the Integration of Green and Sustainable Chemistry into the Undergraduate Curriculum: Greening our Practice with Scientific and Engineering Practices. **2023** (Submitted)

Zhang, M.; Day, E. L.; **McFall-Boegeman, H.**; Petritis, S. J.; Cooper, M. M. Incorporation of Green Chemistry Into Undergraduate Organic Laboratory Using Cooperative Project-Based Experiments and Case Studies. *Green Chem Lett. Rev.* **2023**, 16, 2183781 DOI: [10.1080/17518253.2023.2183781](https://doi.org/10.1080/17518253.2023.2183781)

*Part of a Special Issue “2022 Advances in Green Chemistry Education”

McFall-Boegeman, H. Investigations into the Virus-Like Particle Bacteriophage Q β as a Carrier Platform in Conjugate Vaccines Against Cancer and Alzheimer’s Disease Michigan State University, ProQuest Dissertations Publishing, **2022**.

Sungsuwan, S., Wu, X., Shaw, V., Kavunja, H., **McFall-Boegeman, H.**, Rashidjahanabad, Z., Tan, Z., Lang, S., Nick, S., Lin P.-H., Yin, Z., Ramadan, S., Jin, X., Huang, X. Structure Guided Design of Bacteriophage Q β Mutants as Next Generation Carriers for Conjugate Vaccines. *ACS Chem. Biol.* **2022**, 17, 3047-3058 DOI: [10.1021/acscchembio.1c00906](https://doi.org/10.1021/acscchembio.1c00906)

*Part of a Special Issue “Chemical Glycobiology”

Author profile in Hughes, K. Introducing Our Authors. *ACS. Chem. Biol.* **2022, 17, 493-494

Rashidjahanabad, Z., Kelly, M., Kamruzzaman, M., Qadri, F., Bhuiyan, T., **McFall-Boegeman, H.**, Wu, D., Piszczek, G., Xu, P., Ryan, E. T., Huang, X. Virus Like Particle Display of Vibrio Cholerae O-Specific Polysaccharide as a Potential Vaccine Against Cholera. *ACS Infect. Dis.* **2022**, 8, 574-583 DOI: [10.1021/acsinfectdis.1c00585](https://doi.org/10.1021/acsinfectdis.1c00585)

*Part of a Special Issue “Glycoscience in Infectious Disease”

**This work has been highlighted by multiple news websites : [ChemistryViews](#) [GEN Science Daily](#) [ScienMag](#) [UK Today News](#) [Newswise](#) [EurekAlert!](#) [Mirage News](#) [MedicalXpress](#) [The Medical News](#) [Technology Networks](#) [Scitech Daily](#)

McFall-Boegeman, H., Huang, X. Mechanisms of Cellular and Humoral Immunity Through the Lens of VLP-Based Vaccines. *Expert Rev. Vaccines* **2022**, 21, 453-469 DOI: [10.1080/14760584.2022.2029415](https://doi.org/10.1080/14760584.2022.2029415)

Wu, X., **McFall-Boegeman, H.**, Rashidjahanabad, Z., Liu, K., Pett, C., Yu, J., Schorlemer, M., Ramadan, S., Behren, S., Westerlind, U., Huang, X. Synthesis and Immunological Evaluation of the Unnatural β -linked Mucin-1 Thomsen-Friedenreich Conjugate. *Org. Biomol. Chem.* **2021**, 19, 2448-2455. DOI: [10.1039/D1OB00007A](https://doi.org/10.1039/D1OB00007A)

*Part of the themed collection “Glycosylation: New Methodologies and Applications”

Presentations

Oral Presentations

McFall-Boegeman, H., Conjugate Vaccine Design Against Non-Infectious Diseases, University of Minnesota-Morris Chemistry Seminar Series, Morris, MN 2023 (Invited)

McFall-Boegeman, H., Introduction to the Sweeter Side of Life (a.k.a. Carbohydrates), Northwest Missouri State University, Maryville, MO 2022 (Invited)

McFall-Boegeman, H., Day, E. L., Zhang, M., Petritis, S., Cooper, M. M. Incorporating Green and Sustainable Chemistry Case Studies into an Undergraduate Organic Chemistry Course, Future Academic Scholars in Teaching Fellowship Program, 16th Annual Symposium, East Lansing, MI 2022

McFall-Boegeman, H., Day, E. L., Cooper, M. M. Case-Studies as a Method of Incorporating Green and Sustainable Chemistry into Undergraduate Organic Chemistry Courses, 262nd American Chemical Society National Meeting & Exposition, San Diego, CA, 2022

McFall-Boegeman, H., Day, E. L., Cooper, M. M. Employing Case-Studies to Incorporate Green Chemistry Principles in Undergraduate Organic Chemistry Courses, 25th Annual Green Chemistry & Engineering Conference, Virtual, 2021

McFall-Boegeman, H., Rashidijahanabad, Z., Wu, Xuanjun, Liu, K., Pett, C., Yu, J., Schorlemer, M., Ramadan, S., Behren, S., Westerlind, U., Huang, X. An Unnatural β -Linked Mucin-1 Glycopeptide Vaccine Can Elicit Protective Antibodies Towards the Native Antigen 16th Midwest Carbohydrate and Glycobiology Symposium, Ann Arbor, MI, 2020

McFall-Boegeman, H., Huang, X. Fun in Candyland, Department of Chemistry Graduate Recruitment Seminar, East Lansing, MI 2019

McFall-Boegeman, H. Engineering of Bacteriophage Q β to Elicit Anti-Tumor Cytotoxic T Cells, Cancer Biology Symposium, East Lansing, MI, 2018 (Invited)

Poster Presentations

McFall-Boegeman, H. Kayed, R. Huang, X. Virus-Like Particle Based Conjugate Vaccine Targeting Tau Aggregation 262nd American Chemical Society National Meeting & Exposition, San Diego, CA, 2022

McFall-Boegeman, H., Rashidijahanabad, Z., Wu, Xuanjun, Liu, K., Pett, C., Yu, J., Schorlemer, M., Ramadan, S., Behren, S., Westerlind, U., Huang, X. Synthesis and Immunological evaluation of β Tf-MUC1 conjugate vaccines 262nd American Chemical Society National Meeting & Exposition, San Diego, CA, 2022 (Abstract selected for Sci-Mix from CARB Division)

McFall-Boegeman, H., Tan, Z., Huang, X. Engineering of Bacteriophage Q β for Use as a Conjugate Vaccine Platform 15th Midwest Carbohydrate and Glycobiology Symposium, Notre Dame, IN, 2019

McFall-Boegeman, H., Tan, Z. Huang, X. Chemically and Genetically Engineered Bacteriophage Q β as Carbohydrate-Based Anti-Tumor Vaccine Carriers, 14th Midwest Carbohydrate and Glycobiology Symposium, East Lansing, MI, 2018

Wu, X., **McFall-Boegeman, H.**, Yin, Z., McKay, C., Finn, M. G., Huang, X. Bioconjugation of Bacteriophage Q β with Tumor Associated MUC1 Antigen or Cytotoxic T Cell Epitopes for Anti-Cancer Vaccine Development, 13th Midwest Carbohydrate and Glycobiology Symposium, Madison, WI, 2017

McFall-Boegeman, H., Zhu, M., Lybbert, B. N. Using Essential Oils to Teach Chromatography and Separation Techniques in Undergraduate Organic Chemistry Labs (Abstract Selected for Recognition by ACS Committee on Education), 251st American Chemical Society National Meeting & Exposition, San Diego, CA, 2016

McFall-Boegeman, H., Strenge, S., Pappenfus, T. Synthesis of Organic Materials for Use in Printable Organic Photovoltaics, Undergraduate Research Symposium, Morris, MN, 2015

Contributed Presentations

*Denotes undergraduate mentee

Petritis, S. J.; Day, E. L.; Cooper, M. M.; Zhang, M.; **McFall-Boegeman, H.** Investigating Student Reasoning in Green and Sustainable Chemistry through the Design-Based Research of Decision Memos. 2022 Biennial Conference on Chemical Education, West Lafayette, IN, 2022 (Oral Presentation)

Zhang, M.; Day, E. L.; **McFall-Boegeman, H.**; Cooper, M. M. Integrating Green Chemistry into the Organic Laboratory using Project-based Experiments and Case Studies. 2022 Biennial Conference on Chemical Education, West Lafayette, IN, 2022 (Oral Presentation)

Petritis, S. J.; Day, E. L.; Cooper, M. M.; Zhang, M.; **McFall-Boegeman, H.** “Exploring Students’ Green Decision-Making through a Design-Based Research Cycle.” 26th Annual Green Chemistry & Engineering Conference, Reston, VA, 2022. (Oral Presentation)

Zhang, M.; Day, E. L.; **McFall-Boegeman, H.**; Cooper, M. M.; Maleczka, R. E. “Transformation of MSU’s Large Enrollment Undergraduate Organic Chemistry Laboratory Course: Beta-testing of New Green Chemistry Project-based Labs”. 26th Annual Green Chemistry & Engineering Conference, Reston, VA, 2022. (Oral Presentation)

Zhang, M.; Day, E. L.; Alay, H.; Nakisa, A.; **McFall-Boegeman, H.**; Cooper, M. M.; Maleczka, R. E. Project-Based Undergraduate Instructional Laboratory Highlighting Green Chemistry, The Chemistry Laboratory: Evaluation, Assessment, & Research Symposium, Australia, 2022 (Online Poster)

Zhang, M.; Day, E. L.; Cooper, M. M.; **McFall-Boegeman, H.** Assessment of Catalyst Efficiency and Evaluation of Different Synthetic Routes from Green Chemistry Perspectives; A Project-Based Undergraduate Experiment, 262nd American Chemical Society National Meeting & Exposition, San Diego, CA, 2022 (Poster)

Day, E. L., **McFall-Boegeman, H.**, Cooper, M. M. Engaging Students’ Chemistry Knowledge to Explain and Evaluate Sustainability Issues, AAAS Annual Meeting, Online, 2021 (Online Poster)

Day, E. L., **McFall-Boegeman, H.**, Cooper, M. M. Evidence-Centered Design of Green Organic Chemistry Case Studies: Elucidating Scientific and Engineering Practices for Green Chemistry Phenomena, X-DBER, Lincoln, NE, 2021 (Online Poster)

Ward, D.*, **McFall-Boegeman, H.**, Huang, X. Stereoselective Synthesis of MUC1- β Tf Glycopeptides for use in Anti-Cancer Vaccines, Mid-Michigan Symposium for Undergraduate Research Experiences, East Lansing, MI, 2019 (Poster)