**Brian Fuglestad, Ph.D.**

Department of Chemistry, Virginia Commonwealth University

3045 Oliver Hall, 1001 W. Main St., Richmond, VA 23284

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**Positions**

**Assistant Professor** 2019 - present

Virginia Commonwealth University

Department of Chemistry

**Member**

Center for Drug Discovery 2020 - present

Virginia Commonwealth University

**Education & Training**

**Postdoctoral Associate** 2013 - 2019

University of Pennsylvania Perelman School of Medicine

Department of Biochemistry & Biophysics

Research Advisor: A. Joshua Wand

**Ph.D., Chemistry** 2007-2013

University of California, San Diego

Research Advisor: Elizabeth Komives

**B.S., Biochemistry** 2003-2007

Oklahoma State University

Research Advisor: Michael Massiah

**Research**

***Independent Publications, VCU***

11) Birchfield AS, Musayev FN, Castillo AJ\*, Zorn G#, **Fuglestad B**. (2025) Broad PFAS binding with fatty acid binding protein 4 is enabled by variable binding modes. *bioRxiv* 2025.01.10.632451; doi.org/10.1101/2025.01.10.6324519.

10) Walters SH\*, Signorelli RL\*, Payne AG#, Hojjatian A, **Fuglestad B**. (2025) Compositional versatility enables biologically inspired reverse micelles for study of protein-membrane interactions. *Soft Matter*, 2025, DOI: 10.1039/D5SM00033E (published online)

9) Walters SH\*, Birchfield AS, **Fuglestad B**. (2024) Advances in utilizing reverse micelles to investigate membrane proteins. *Biochemical Society Transactions,* 52 (6), 2499-2511.

8) Walters SH\*, **Fuglestad B**. (2024) An NMR approach for investigating membrane protein-lipid interactions using native reverse micelles. *Bio-protocol,* 14(14), e5039.

7) Labrecque CL\*, **Fuglestad B**. (2024) Ligandability at the membrane interface of GPx4 revealed through a reverse micelle fragment screening platform. *JACS Au,* 4(7), 2676-2686.

6) Stackhouse CI, Pierson KN, Labrecque CL\*, Mawson C, Berg J, **Fuglestad B**, Nucci NV. (2024) Characterization of 10MAG/LDAO reverse micelles: Understanding versatility for protein encapsulation. *Biophysical Chemistry*, *311, 107269.*

5) Develin AM\*, **Fuglestad B**. (2024) Inositol Hexaphosphate as an Inhibitor and Potential Regulator of p47phox Membrane Anchoring. *Biochemistry*. 63(9):1097-1106. (*Featured on the front cover*)

4) Mahmoud R, Kalivarathan J, Castillo AJ\*, Wang S, **Fuglestad B**, Kanak MA, & Dhakal S. (2023) Aptabinding of tumor necrosis factor‐α (TNFα) inhibits its proinflammatory effects and alleviates islet inflammation. *Biotechnology Journal,*19(1), 2300374.

3) Walters SH\*, Castillo AJ\*, Develin AM\*, Labrecque CL\*, Qu Y, **Fuglestad B**. (2023) Investigating protein‐membrane interactions using native reverse micelles constructed from naturally sourced lipids. *Protein Science*, e4786. (*Featured on the front cover*)

2) Labrecque CL\*, Nolan AL#, Develin AM\*, Castillo AJ\*, Offenbacher, AR, **Fuglestad B**. (2022) Membrane-mimicking reverse micelles for high-resolution interfacial study of proteins and membranes. *Langmuir, 38*(12),3676-3686. (*Featured on the front cover*)

1) Labrecque CL\*, **Fuglestad B**. (2021) Electrostatic drivers of GPx4 interactions with membrane, lipids, and DNA. *Biochemistry,* 60(37)*,* 2761-2772.

\*VCU Graduate group member

#VCU Undergraduate group member

***Previous Publications***

15) MacKenzie, DWS, Schaefer A, Steckner J, Leo CA, Naser D, Artikis E, Broom A, Ko T, Shah P, Ney MQ, Tran E, Smith MTJ, **Fuglestad B**, Wand AJ, Brooks III CL, Meiering EM. (2022) A fine balance of hydrophobic-electrostatic communication pathways in a pH-switching protein. *Proceedings of the National Academy of* Sciences*, 119*(26), e2119686119.

14) O'Brien ES,**Fuglestad B**, Lessen HJ, Stetz MA, Lin DW, Marques BS, Gupta K, Fleming KG, Wand AJ. (2020) Membrane Proteins Have Distinct Fast Internal Motion and Residual Conformational Entropy. *Angewandte Chemie, 59(*27), 11108-11114.

13) **Fuglestad B**, Kerstetter NE, Bédard S, and Wand AJ. (2019) Extending the Detection Limit in Fragment Screening of Proteins Using Reverse Micelle Encapsulation. *ACS Chemical Biology, 14*(10), 2224-2232.

12) **Fuglestad B**, Kerstetter NE, and Wand AJ. (2019) Site-resolved and quantitative characterization of very weak protein-ligand interactions." *ACS Chemical Biology, 14*(7), 1398-1402.

11) **Fuglestad B**, Gupta K, Wand AJ, & Sharp K. (2019) Water loading driven size, shape, and composition of CTAB/hexanol/pentane reverse micelles. *Journal of Colloid and Interface Science, 540,* 207-217.

10) **Fuglestad B**, Marques BS, Jorge C, Kerstetter NE, Valentine KG, & Wand AJ. (2019) Reverse micelle encapsulation of proteins for NMR spectroscopy. *Methods in Enzymology, 615,* 43-75.

9) O’Brien ES, Lin DW, **Fuglestad B**, Stetz MA, Gosse T, Tommos C, & Wand AJ. (2018). Improving yields of deuterated, methyl labeled protein by growing in H2O. *Journal of Biomolecular NMR*, *71*(4), 263-273.

8) **Fuglestad B,** Stetz MA, Belnavis Z, & Wand AJ. (2017) Solution NMR investigation of the response of the lactose repressor core domain dimer to hydrostatic pressure. *Biophysical Chemistry*, *231*, 39-44.

7) Handley LD\*, **Fuglestad B\***, Stearns K, Tonelli M, Fenwick RB, Markwick PR, & Komives EA. (2017). NMR reveals a dynamic allosteric pathway in thrombin. *Scientific Reports*, *7*, 39575.

6) **Fuglestad B**, Gupta K, Wand AJ, & Sharp KA. (2016). Characterization of cetyltrimethylammonium bromide/hexanol reverse micelles by experimentally benchmarked molecular dynamics simulations. *Langmuir*, *32*(7), 1674-84.

5) O'Brien ES, Nucci NV, **Fuglestad B**, Tommos C, & Wand AJ. (2015). Defining the apoptotic trigger the interaction of cytochrome c and cardiolipin. *Journal of Biological Chemistry*, *290*(52), 30879-87.

4) Nucci NV, **Fuglestad B**, Athanasoula EA, & Wand AJ. (2014). Role of cavities and hydration in the pressure unfolding of T4 lysozyme. *Proceedings of the National Academy of Sciences*, *111*(38), 13846-51.

3) **Fuglestad B\***, Gasper PM\*, McCammon JA, Markwick PR, & Komives EA. (2013). Correlated motions and residual frustration in thrombin. *The Journal of Physical Chemistry B*, *117*(42), 12857-63.

2) Gasper PM, **Fuglestad B**, Komives EA, Markwick PR, & McCammon JA. (2012). Allosteric networks in thrombin distinguish procoagulant vs. anticoagulant activities. *Proceedings of the National Academy of Sciences*, *109*(52), 21216-22.

1) **Fuglestad B**, Gasper PM, Tonelli M, McCammon JA, Markwick PR, & Komives EA. (2012). The dynamic structure of thrombin in solution. *Biophysical Journal*, *103*(1), 79-88. (Featured on the July 3rd, 2012 *Biophysical Journal* issue cover.)

***Patents, VCU***

1. Fuglestad, B. and Labrecque, C.L., and. Novel inhibitor building blocks for the cancer target glutathione peroxidase 4 (GPx4). USTPO Patent Application. 05/02/24. 63/641,508.

**Awards and honors, independent career**

**Eli Lilly Young Investigator Award, 2024**

Awarded once per year by the Eli Lilly Analytical Chemistry Academic Contacts Committee, given to ‘rising stars’ in the analytical chemistry field, broadly defined.

**Research Grants**

1R35GM147221, **Fuglestad (PI)** 09/2022 – 07/2027

NIH/NIGMS
*Peripheral membrane proteins and disease: tool development, basic investigations, and inhibitor design*

$1,940,625 total over 5 years (all to Fuglestad) + $87,500 equipment supplemental

Eli Lilly Young Investigator Award, **Fuglestad (PI)** 01/2025 – 01/2027

Unsolicited and unrestricted grant associated with the award.

$150,000 over two years (all to Fuglestad)

W81XWH2210102 Kanak (PI), **Fuglestad (Co-PI)**, Dhakal (Co-PI) 03/2022 – 02/2025

The Assistant Secretary of Defense for Health Affairs endorsed by the Department of Defense *Bioengineering islets with aptamers that block IBMIR in islet transplantation*

$309,452 total ($63,743 to Fuglestad)

1R01GM143176 Cen (PI), **Fuglestad (co-PI)**, Safo (co-PI) 05/2022 – 01/2026

NIH/NIGMS

Small molecule approach to activate human SIRT5

$1,454,953 total (Fuglestad’s budget returned upon receipt of the above R35, per NIGMS guidelines)

Donnenberg (PI), **Fuglestad (co-PI)**  07/2021 – 12/2024

Wright Center for Translation Research, VCU

*Interactions and structure of the essential Type 4 Pilus component BfpU.*

$119,574 total ($38,234 to Fuglestad)

**Service and Scientific Outreach**

***Department Service***

Chemistry Department Graduate Scholarships Committee August 2019 - present

Chemical Biology Program Graduate Admissions Committee August 2019 - present

Chemistry Department Graduate Admissions Committee August 2019 – present

Curriculum Redesign Committee for the Chemistry PhD program 2023

General Chemistry Term Faculty Hiring Committee December 2024 – present

Organic/Biochemistry Term Faculty Hiring Committee December 2024 – present

***University Service***

NSF-GRFP internal review panel August 2022-present

Panelist for “I wish I knew when” Q&A for VCU Grant Academy 2023 & 2024

Poster judge, VCU graduate research symposium April 2023

University Core Facilities Task Force2021

***National Service and Outreach***

VCU ACS Project SEED Mentor Summers 2022 - 2024

VCU NSF Research Experiences for Undergraduates Mentor Summers 2021 & 2022

Protein Science Early Career Review Board 2022- present

***Journal Review***

*JACS Au*

*Analytical Chemistry*

*Protein Science*

*ACS Omega*

*Langmuir*

*BBA-Biomembranes*

*Communications Chemistry*

*Molecules*

***Grant Review***

VCU Breakthrough awards

 The Longer Life Foundation

**Invited External Seminars, Contributed, and Invited Conference Talks.**

* *New strategies for exploring function, structure, and inhibition at protein-membrane interfaces.* Department of Biological & Biomedical Sciences, Rowan University, Glassboro, NJ. April 28th, 2025.
* *New NMR-based strategies for exploring function, structure, and inhibition within protein-membrane interfaces.* NMR Topical Group of the North Jersey Section – American Chemical Society, Virtual Seminar, Feb. 20th, 2025.
* *Enhanced tools and strategies for exploration of structure, function, and inhibition at protein-membrane interfaces.* Molecular Biophysics of Membranes-Biophysical Society, Invited Speaker, Tahoe, CA. June 3rd, 2024.
* *Reverse micelles as membrane mimetics: Enhancing exploration of structure, function, and inhibition at protein-membrane interfaces.* Symposium & Workshop on High-Pressure and Reverse Micelle NMR, Invited speaker and workshop organizer, College Station, TX. April 6th, 2024.
* *New strategies and tools for revealing function, structure, and inhibition at protein-membrane interfaces.* Department of Chemistry, Old Dominion University, Norfolk, VA. March 22nd, 2024.
* *Exploring function, structure, and inhibition at protein-membrane interfaces using new strategies and an expanded toolbox.* Department of Chemistry, East Carolina University, Greenville, NC. Dec. 1st, 2023.
* *Improved tools for exploration of structure, function, and inhibition at the protein-membrane interface.* Southeastern Regional Meeting of the American Chemical Society, contributed talk and session chair, Durham, NC, October 25th, 2023.
* *Enhancing investigations of structure, function, and inhibition at the protein-membrane interface.* Department of Chemistry, University of Virginia, Charlottesville, VA. Sept. 1st, 2023.
* *Novel strategies to advance exploration of function and inhibition within protein-membrane interfaces.* Department of Chemistry and Biochemistry, University of Maryland, College Park, MD. April 4th, 2023.
* *New approaches for functional study and inhibition of peripheral membrane proteins.* 264th American Chemical Society National Meeting; Chicago, IL. August 24th, 2022.
* *Seeing the invisible and drugging the undruggable: Nanoscale encapsulation in protein NMR.* Department of Chemistry. Uppsala University, Sweden. Virtual, June 9th, 2021.
* *Seeing the invisible and drugging the undruggable:**Applications of protein nano-encapsulation.* Department of Chemistry & Biochemistry, Northern Kentucky University. Virtual, October 14th, 2020.

**Student and Trainee Mentoring**

***VCU Postdoc mentoring***

Dr. Aaron Birchfield (2024 – present)

***VCU Chemistry & Chemical Biology Ph.D. Students***

Mackenzie Smith (Chem. Biol., 2024 – present)

Kelly Petersen (Chemistry, 2024 – present)

Jake Breeden (Chemistry, 2023 – present)

Rachel Signorelli (Chemistry, 2023 – present)

Sara Walters (Chemistry, 2021 – present)

Abdul Castillo (Chemistry, 2019 – 2024) Currently working in the lab as a Research Assistant.

Angela Develin (Chem. Biol., 2019 – 2024) Currently a postdoc with Boehringer Ingelheim.

Courtney Labrecque (Chem Biol., 2019 – 2024) Currently a postdoc at UCLA Medical School.

***VCU Undergraduate Research Students***

Kyla Cang (2024 – present)

Allyson Payne (2023 – present)

George Zorn (2022 – 2023) Subsequently in PhD program, McGill University

Sakinah Owens (2021 – 2023) Subsequently in Post-Baccalaureate program, NIH-NCI

Olympia Otulakowski (REU, 2023) Subsequently in PhD program, Notre Dame

Alana Thomas-Yates (2022) Subsequently pursuing Bachelor’s degree, VCU

Aubree Nolan (REU, 2022) Subsequently in PhD program, Kent State

Farheen Zaman (2019 – 2021) Subsequently in MD program, Drexel

Nadia Ali (2019 – 2021) Subsequently in MD program, Georgetown

Jed Kucharczk (2019 – 2020) Subsequently pursuing Bachelor’s degree, VCU

**Teaching, VCU**

**Biochemistry I, Primary Instructor (CHEM403)** Spring 2020 - Spring 2022
*Department of Chemistry.*

Final Enrolment, Spring 2020: 81 (started in-person, moved online, asynchronous in March)
 Spring 2021: 100 (online, asynchronous)
 Spring 2022: 60 (in-person)
 Spring 2025: 60 (in-person)

**Chemical Biology I, Primary Instructor (CHEB601)** Fall 2019 - Fall 2023
*Chemical Biology PhD program.*

Final Enrolment, Fall 2019: 8 (in-person)
 Fall 2020: 5 (online, synchronous)
 Fall 2021: 3 (online, synchronous)
 Fall 2022: 7 (in-person)
 Fall 2023: 4 (in-person)
 Fall 2024: 9 (in-person)

**Professional Practices and Perspectives Seminar (CHEM 398)** Spring 2024
*Department of Chemistry.*

Final Enrolment, Spring 2024: 29 (in-person)

**Med. Chem. And Drug Design, Guest Lecturer (CHEM310/MEDC 310)** Spring 2021 - Spring 2024

*VCU School of Pharmacy/Department of Chemistry cross-listed.*

**Fundamentals of Drug Discovery II, Guest Lecturer (MEDC 556)** Spring 2020 – Spring 2024

*Virginia Commonwealth University, School of Pharmacy.*

**Professional Organization Membership**

American Society for Pharmacology and Experimental Therapeutics 2017 - present

American Association for the Advancement of Science 2017 - present

American Chemical Society 2016 - present

Protein Society 2016 - present

Biophysical Society 2011 - present