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
Institute of Structural Biology, Drug Discovery, and Development 2020 - present
Virginia Commonwealth University

Education & Training

Postdoctoral Associate/Research 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

Publications

Independent Publications, VCU

21) 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.*
20) 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*)
19) 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.
18) 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*)
17) 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*)
16) Labrecque CL, **Fuglestad B**. (2021) Electrostatic drivers of GPx4 interactions with membrane, lipids, and DNA. *Biochemistry, 60*(37)*,* 2761-2772.

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 H_2O. *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.)

Awards and Honors

- Mid-Atlantic Pharmacology Society Annual Meeting Poster Award, 1st place, October 2017
- 16th Annual UPenn Biomedical Post-Doctoral Research Symposium Poster Award 2nd place, October 2017
- University of Maryland/NIST Neutron Outreach Program Award, May 2016

- NVIDIA Academic Hardware Grant award, October 2015
- American Heart Association Predoctoral Fellowship 10PRE3730057, UCSD, 2010-2012
- NIH Molecular Biophysics Training Grant T32 GM08326, UCSD, 2008-2010
- Lou Wentz Research Project Award, Oklahoma State University, 2007

Teaching

Biochemistry I, Primary Instructor (CHEM403) Spring 2020 - Spring 2022
Virginia Commonwealth University

Chemical Biology I, Primary Instructor (CHEB601) Fall 2019 - Fall 2023
Virginia Commonwealth University

Med. Chem. And Drug Design, Guest Lecturer (CHEM310/MEDC 310) Spring 2021, Spring 2022
Virginia Commonwealth University, School of Pharmacy

Fundamentals of Drug Discovery II, Guest Lecturer (MEDC 556) Spring 2020 - Fall 2023
Virginia Commonwealth University, School of Pharmacy

Teaching Assistant Fall 2007 - Fall 2008
University of California, San Diego
General Chemistry (x2)
Analytical Chemistry Lab
General Chemistry Lab

Service and Scientific Outreach

Department and University Service, VCU

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
NSF-GRFP internal review panel August 2022-present
University Core Facilities Task Force January 2021-December 2021

National Service and Outreach

VCU ACS Project SEED Mentor Summers 2022 & 2023
VCU NSF Research Experiences for Undergraduates Mentor Summers 2021 & 2022
Protein Science Early Career Review Board 2022- present
Manuscript Reviewer: *Protein Science, ACS Omega, Langmuir (ACS), BBA-Biomembranes, Communications Chemistry, Molecules (MDPI).*

Pre-VCU Service, University of Pennsylvania

Chair, Biomedical Post-doctoral Council Outreach and Service Committee April 2016 - April 2018
Biomedical Post-doctoral Council Symposium Committee July 2015 - October 2016
Biomedical Post-doctoral Council Outreach and Service Committee May 2015 - April 2016

Student Mentoring and Supervision

VCU Chemistry & Chemical Biology Ph.D. Students October 2019 - present
Angela Develin
Courtney Labrecque
Jake Breeden
Abdul Castillo
Sara Walters
Rachel Signorelli

VCU Undergraduate Research Students October 2019 - present

Nadia Ali
Farheen Zaman
Sakinah Owens
George Zorn
Jed Kucharczk
Aubree Nolan (REU, 2022)
Alana Thomas-Yates
Olympia Otulakowski (REU, 2023)

UPenn Biochemistry and Biophysics Ph.D. Rotation Students Summer 2015, Summer 2016
Nicholas Rego
Nicole Kerstetter

UPenn Undergraduate Research Students 2013 - 2019
Yoojung Kim
Hannah Cai
Zachary Belnavis
Ethan Genyk
Ahmed Farhan
Malia Mandl
Travis Gosse
Viandrudigo Djianto

UCSD Academic Connections Research Scholars program Summer 2010, Summer 2011
Jett Paulk

UCSD Chemistry and Biochemistry Ph. D. Rotation Students Fall 2010, Fall 2011
Christopher Vikery
Christopher Haushalter
Lindsay Dawson

UCSD Undergraduate Research Students Fall 2011 - Spring 2013
Peiling Leu
Kyle Stearns

Invited External Seminars and Contributed Conference Talks.

- *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.* Deptartment of Chemistry & Biochemistry, Northern Kentucky University. Virtual, October 14th, 2020.
- *The Weakest of Weak Protein Interactions: Reverse Micelles as a Platform for Hydration Dynamics and Drug Discovery.* Department of Molecular & Cellular Biosciences. Rowan University, Glassboro, NJ. September 15th, 2017.
- *Hydration in the Cavities and at the Surface of Interleukin-1β,* 252nd American Chemical Society National Meeting; Philadelphia, PA. August 2016.
- *Reverse Micelle NMR: An Exotic Solution to Fundamental Problems in Biophysics and Drug Discovery*. Department of Chemistry. Ursinus College, Collegeville, PA. October 9th, 2015.

- *Reverse Micelle NMR: Confined Space, Structural Biology, Biophysics and Drug Discovery*. Presented for the BioMAPS Institute for Quantitative Biology at Rutgers University. New Brunswick, NJ. April 23rd, 2015.

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

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 (to Fuglestad) + $87,500 equipment supplemental

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)

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)

Donnenberg (PI), **Fuglestad (co-PI)** 07/2021 – 12/2023
Wright Center for Translation Research, VCU
Interactions and structure of the essential Type 4 Pilus component BfpU.
$119,574 total ($38,234 to Fuglestad)