

Dominique Ebony Williams, Ph.D.

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PROFESSIONAL EXPERIENCES:

University of Richmond, Richmond, VA August 2018 – Present

Assistant Professor of Chemistry

Research: Bio-inorganic Chemistry, Metal-assisted Hydrolysis, Metal-based Anti-biofilm Agents, Metal-based Pesticide Detoxification Agents

Teaching: General Chemistry, Biochemistry, Experimental Biochemistry

Stony Brook University, Stony Brook, NY June 2015 – May 2018

Postdoctoral Scholar

Research: Nitric Oxide and Cyclic di-GMP Signaling Pathways Associated with Bacterial Biofilm Formation

Teaching: General Chemistry (College at Old Westbury as IRACDA Scholar)

Georgia State University, Atlanta, GA August 2009 – May 2014

Graduate Research and Teaching Assistant

Research: Metal-assisted Hydrolysis and Photocleavage of Phospholipids and DNA

Teaching: Teaching Assistant for Biochemistry and General Chemistry Lecture and Labs

EDUCATION:

Doctor of Philosophy, Chemistry/Biochemistry Concentration 2014

Georgia State University, Atlanta, GA

The Cleavage of Lipids and DNA by Metal Ions and Complexes, Dr. Kathryn B. Grant

Virginia Commonwealth University, Richmond, VA 2009

Bachelor of Science, Chemistry

PAST RESEARCH EXPERIENCES:

Stony Brook University, Stony Brook, NY June 2015 – May 2018

NIH IRACDA Postdoctoral Scholar

- Investigate nitric oxide-associated signaling pathways that regulates bacterial biofilm formation and motility in *Agrobacterium vitis*, *Shewanella woodyi*, and *Pseudomonas aeruginosa*.
- Prepare and review manuscripts for publication and present research findings at scientific conferences
- Perform chemical biology research and technical support to ensure quality laboratory operating systems
- Mentor and train undergraduate and graduate students to design and troubleshoot experiments

Department of Energy National Energy Technology Laboratory, Morgantown, WV June 2014 – August 2014

ORISE Mickey Leland Intern (3-month internship)

- Performed solid state synthesis of lithium and sodium ion electrolytes to be used in battery material
- Characterized material with x-ray powder diffraction
- Utilized impedance spectroscopy to determine ionic conductivity of material

Georgia State University, Department of Chemistry, Atlanta, GA August 2009 – May 2014

Graduate Research Assistant

- Investigated and developed potential metal-based hydrolytic and photocleavage agents of DNA and lipid bilayers
- Employed malachite green phosphate and Amplex® red assays, ESI-MS, and NMR to detect product production
- Evaluated DNA photocleavage reactions by Cu(II) complexes and cyanine dyes
- Mentored and trained undergraduate and graduate students to design and troubleshoot experiments

PAST TEACHING EXPERIENCES:

Suffolk County Community College, Selden, NY

Instructor Assistant, IRACDA Postdoctoral Scholar

January 2017 – May 2017

Foundation of College Chemistry (Non-majors), 3 credits

- Assisted with the development of course material and content, and execution of hybrid online course
- Instructed an in-person recitation session that met once a week

State University of New York College at Old Westbury, Old Westbury, NY

August 2016 – December 2016

Instructor of Record, IRACDA Postdoctoral Scholar

Principles of Chemistry I, 3 credits

- Instructed a classroom of 48 students in a semester-long general chemistry course for science majors
- Developed course content, such as lecture PowerPoint, in-class activities, homework, quizzes, and exams
- Employed active learning strategies in classroom, such as frequent in-class group work

Georgia State University, Department of Chemistry, Atlanta, GA

August 2009 – December 2012

Teaching Assistant

Survey of Chemistry I Laboratory

Principles of Chemistry I Laboratory

- Promoted the use of safe laboratory skills to ~ 50 undergraduate students in chemistry labs
- Directed students in completing experimental procedures and post-lab questions

Biochemistry lecture

- Assisted professor in the preparation of exams and organization of learning materials for a class of ~ 200 students

Chemistry I Concept Development

Chemistry II Concept and Development

- Instructed a problem solving tutorial for general chemistry students

PUBLICATIONS:

In-press

- **Williams, E. D.**, Boon, M. E., Towards Understanding the Molecular Basis of NO-regulated Group Behaviors in Pathogenic Bacteria. *J Innate Immun.* **2018** (Ahead of Print), <https://doi.org/10.1159/000494740>
- **Williams, E. D.**, Nisbett, L-M., Boon, M. E., Bacterial Heme-based Sensors of Nitric Oxide *Antioxidants and Redox Signaling* **2018**, 29, 1872-1887, <https://doi.org/10.1089/ars.2017.7235>
- Safarian, S. M., Sawoo, S., Mapp, T. C., **Williams, E. D.**, Gude, L., Fernández, M-J., Lorente, A., Grant, B. K., Aminomethylanthracene Dyes as High Ionic Strength DNA Photocleaving Agents: Two Rings Are Better than One *Chemistry Select* **2018**, 3, 4897-4910, <https://doi.org/10.1002/slct.201703019>
- **Williams, E. D.**, Fischer, J., Heckler, I., Boon, M. E., 2018. Heme-based Sensors of Nitric Oxide. In: Shigetoshi Aono ed., Gas Sensing in Cells. Metallobiology series of RSC, Croydon (UK) p. 15-46
- **Williams, E. D.**, Kassai, M., Gude, L., Fernández, M., Lorente, A., Grant, K. B., An Unlikely DNA Cleaving Agent: A Photoactive Tri-nuclear Cu(II) Based on Hexaazatriphenylene. *J. Inorg. Biochem.* **2017**, 168, 55-66, <https://doi.org/10.1016/j.jinorgbio.2016.12.007>
- Abreu-Sepulveda, M.*; **Williams, E. D.***; Huq, A.; Dhital, C.; Li, Y.; Paranthaman, M. P.; Zaghbi, K.; Manivannan, A., Synthesis and Characterization of Substituted Garnet and Perovskite-based Lithium-ion Conducting Solid Electrolytes *Ionics* **2016**, 22, 317-325, <https://doi.org/10.1007/s11581-015-1556-2> (*coauthor)
- **Williams, E. D.**, Basnet, K., Grant, B. K., Tuning Cerium(IV)-assisted Hydrolysis of Phosphatidylcholine Liposomes under Mildly Acidic Neutral Conditions. *Chem. Bio. Chem.* **2015**, 16, 1474-1482, <https://doi.org/10.1002/cbic.201500041>

- Cepeda, S. S., **Williams, E. D.**, Grant, B. K., Evaluating Metal Ion Salts as Acid Hydrolase Mimics: Metal – assisted Hydrolysis of Phospholipids at Lysosomal pH. *Biometals*. **2012**, 25, 1207-1219, <https://doi.org/10.1007/s10534-012-9583-1>

Submitted or Under Review

- **Williams, E. D.**, Grant, B. K., Metal-Assisted Hydrolysis Reactions Involving Lipids: A Review. *Frontiers in Chemistry* **2018** – Under Review

SELECTED PRESENTATIONS:

- 255th American Chemical Society National Meeting and Exposition, New Orleans, LA, March 22, 2018, “A Biological On/OFF Switch for Bacterial Biofilm Formation”, Talk
- Nitric Oxide Gordon Research Seminar 2017, Ventura, CA, February 19, 2017, “Nitric Oxide Regulation of Cyclic di-GMP Signaling and Biofilm Formation in *Agrobacterium vitis*”, Talk
- SUNY Old Westbury College Senior Seminar, Old Westbury, NY, November 3, 2016, “A Biological On/OFF Switch for Bacterial Biofilm Formation”, Old Westbury, Invited Talk
- Stony Brook Postdoctoral Association Annual Spotlight, Stony Brook, NY, September 17, 2015, “Nitric oxide to the Rescue: A Small Molecule vs. the Bacterial Invasion”, Talk
- 65th Southeast Regional Meeting of the American Chemical Society, Atlanta, GA, November 15, 2013, “Phosphate Ester Hydrolysis of Phosphatidylcholine in Aqueous Solutions of Cerium(IV) and Bis-tris Propane”, Talk
- 246th American Chemical Society National Meeting and Exposition, Indianapolis, In, September 8, 2013, “Synthetic Cerium(IV)-based Catalysts as Mimics of Natural Hydrolases”, Talk
- 2012 Southeastern Regional Meeting of the American Chemical Society, Raleigh, NC, November 15, 2012, “Side by Side Comparison: Cerium(IV)-assisted Hydrolysis of Sphingomyelin and Phosphatidylcholine at Lysosomal pH”, Talk
- 2012 Molecular Basis of Disease Research Day, Atlanta, GA, June 8, 2012, “Optimizing the Catalytic Efficiency of Cerium(IV) Complexes as Lysosomal Phospholipase Mimics”, Talk

LEADERSHIP:

American Chemical Society (ACS), Nationwide

Younger Chemists Committee Full Member

January 2017 – present

Younger Chemists Committee Associate Member

January 2015 – December 2016

- Manage the committee’s symposiums as the Programming Chair using the Meeting Abstracts Programming System of ACS
- Facilitate communication of ideas between the governing bodies of the Society and younger chemists

American Chemical Society (ACS), Atlanta GA

Georgia Local Section ACS Minority Affairs Committee Member

October 2011 – May 2014

- Assisted the Chair in networking events for chemists and outreach activities for the community
- Evaluated high school senior and undergraduate applicants for the Percy Julian Award

Georgia State University, Atlanta, GA

Graduate Student Alliance Committee Founding Member

October 2012 – July 2013

- Founded organization with a group of graduate student representatives
- Influenced the increase of the voice and involvement of graduate students in governance affairs of the University

Chemistry Graduate Student Association President

April 2012 – March 2013

Chemistry Graduate Student Association Vice President

August 2011 – March 2012

- Assisted graduate students in the adjustment and orientation to the graduate program
- Facilitated scientific demonstrations at three local public schools
- Delegated tasks to officers, and town hall meetings and Poster Day Conference (~100 attendees) for graduate students

OTHER EXPERIENCES:

Virginia Commonwealth University, Department of Chemistry, Richmond, VA August 2008 - December 2008
Independent Study

- Performed electrodeposition and the sol-gel method to create impervious silica film on electrodes

Dominion Power Possum Point Power Plant, Dumfries, VA May 2008 - August 2008
Chemist Intern

- Tested water for impurities in the boilers of power producing operating systems

Department of Army of Engineers, Arlington, VA June 2007 - May 2008
Physical Science Lab Technician

- Performed microwave synthesis of rare earth oxides
- Operated a fluorescence spectrometer to analyze luminescence of rare earth oxides

OTHER HONORS AND ASSOCIATIONS:

Georgia State University, Atlanta, GA July 2013 – May 2014
NOBCCChE Public Relations Chair
Association for Women in Science Member April 2013 – May 2014
Molecular Basis of Disease Fellow August 2010 – May 2014
Black Graduate Student Association Community Service Chair May 2010 - June 2012

Virginia Commonwealth University, Richmond, VA September 2008 - May 2009
Louis Stokes Alliance for Minority Participation (LSAMP) member

Virginia Commonwealth University, Richmond, VA August 2006-May 2009
Student Affiliated American Chemical Society President
Student Affiliated American Chemical Society Vice President

AWARDS:

Gordon Research Conference Carl Storm Travel Award February 2017
ACS Postdoc to PUI Professor Workshop Attendee March 2016
Worcester Polytechnic Institute STEM Faculty Launch Program September 2015
Younger Chemists Committee Leadership Development Award December 2013
American Chemical Society Division of Inorganic Chemistry Travel Award July 2013
Graduate Award for Outstanding Professional Service May 2013
2012 Molecular Basis of Disease Research Day 1st place oral presentation June 2012
Women Chemist Committee / Eli Lilly Travel Award April 2011