

Davita L. Watkins, Associate Professor
Department of Chemistry and Biochemistry
William G. Lowrie Department of Chemical and Biomolecular Engineering
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(i) Professional Preparation

Vanderbilt University, Nashville TN	Chemistry, Anthropology	B.S., 2006
University of Memphis, Memphis, TN	Chemistry	Ph.D. 2012
University of Florida, Gainesville, FL	Chemistry	Postdoc 2012-2014

(ii) Appointments

2022 -	Associate Professor of Chemistry, The Ohio State University
2020 - 2022	Associate Professor of Chemistry, University of Mississippi
2014 - 2020	Assistant Professor of Chemistry, University of Mississippi
2012 - 2014	Postdoctoral Research Associate, University of Florida
2007 - 2012	Graduate Research Assistant, University of Memphis
2006 - 2007	Lead Chemical Analyst I, Eurofins Scientific Incorporated
2006 - 2006	Agriculture Science Summer Intern, Monsanto Company

(iii) Selected Publications (Total 48)

1. Ranathunge, T.A.; Curiac C.; Green, K. A.; Kolodziejczyk, W.; Hill, G.; Morgan, S.; Delcamp, J. H.; and Watkins, D. L. "Heteroacene-Based Polymer with Fast-Switching Visible–Near Infrared Electrochromic Behavior," ACS Appl. Mater. Interfaces, 2023, DOI: 10.1021/acsami.2c21111
2. Hamadani, C. M.; Chandrasiri, I.; Yaddehige, M. L.; Dasanayake, G. S.; Owolabi, I.; Flynt, A.; Hossain, M.; Liberman, L.; Lodge, T. P.; Werfel, T. A.; Watkins, D. L.; Tanner, E. E. L., "Improved Nanoformulation and Bio-functionalization of Linear-Dendritic Block-co-Polymers with Biocompatible Ionic Liquids". Nanoscale 2022. DOI: 10.1039/d2nr00538g
3. Chandrasiri, I.; Yaddehige, M. L.; Li, B; Sun, Y; Meador, W.; Dorris, A.; Zia, M. F.; Hammer, N. I.; Flynt, A.; Delcamp, J. H.; Davis, E.; Lippert, A.; and Watkins, D. L. "Crosslinking PCL-PAMAM Linear Dendritic Block Copolymers (LDBC) for Theranostic Nanomedicine," ACS App. Poly. Mater., 2022, DOI: 10.1021/acsapm.1c01131
4. Don, R. W.; Dowell, T. J.; Simms, B. L.; Watkins, D. L.; Wipf, D. O.; and Scott, C.N. "Polyrhodamine: A pH-Responsive Redox Stable Conducting Polyelectrolyte," Polym. Chem., 2021, DOI: 10.1039/D1PY01474A.
5. Yaddehige, M. L.; Chandrasiri, I.; Simms, B. L.; Williams, J. S. D.; Abebe, D. G.; Kucheryavy, P.; Chougule, M. B.; and Watkins, D. L. "Cationic, Anionic and Neutral Functionalized PAMAM - Fatty Acid Amphiphilic Janus Dendrimers for Therapeutic Applications," ChemNanoMat., 2020, DOI:10.1002/cnma.202000498.
6. Chandrasiri, I.; Abebe, D. G.; Yaddehige, M. L.; Williams, J. S. D.; Zia, M. F.; Dorris, A.; Barker, A.; Simms, B. L.; Parker, A.; Le, N.; Gayton, J. N.; Hammer, N. I.; Flynt, A.; Delcamp, J. H.; and Watkins, D. L., "Self-Assembling PCL-PAMAM Linear Dendritic BlockCopolymers (LDBCs) for Bioimaging and Phototherapeutic Applications," ACS Appl. Bio Mater., 2020, DOI: 10.1021/acsabm.0c00432
7. Ranathunge, T. A.; Ngo, D.; Karunathilaka, D.; Attanayake, N. H.; Chandrasiri, I.; Delcamp, J. H.; Rajapakse, R. M. G.; and Watkins, D. L. "Hierarchical Structures of Complex Electronically Conducting Organic Polymers Via One-Step Electro-Polymerization," J. Mater. C., 2020, DOI: 10.1039/c9tc06945c
8. Shewmon, N. T.; Watkins, D. L.; Galindo, J.; Bou Zerdan, R.; Roitberg, A. E.; Xue, J.; Castellano, R. K. "Enhancement in Organic Photovoltaic Efficiency through the Synergistic Interplay of Molecular Donor Hydrogen Bonding and π -Stacking", Adv. Funct. Mater. 2015, 25, 5166-5177. DOI: 10.1002/adfm.201501815
9. Xueying, Z.; Cruz, J. F.; Watkins, D. L.; Xue, J.; Roitberg, A. E.; Castellano, R. K.; Perry, S. S. "Hydrogen Bond Directed Assembly of Oligothiophene/fullerene Superstructures on Au", Org. Electron. 2015, 19, 61-69. DOI: 10.1016/j.orgel.2015.01.022
10. Watkins, D. L.; Fujiwara, T. "Bis-Spiroanththooxazine Based Photochromic Polymer Materials", J. Mater. Chem. C. 2013, 1, 506-514. DOI: 10.1039/C2TC00098A

Ongoing and completed research projects:

Watkins (PI)

Harnessing the Aggregation Behavior of Near-Infrared (NIR-II) Fluorophores via Supramolecular Nano-scaffolds

The goal of this study is to understand how the physicochemical properties of polymers contribute to the emissive properties of fluorophore-polymer conjugates.

Watkins (PI)

10/01/20-09/31/22

American Chemical Society Petroleum Research Fund New Directions: Elucidating the Effects of Molecular Structure on Janus Dendrimers as Ambidextrous Gelators

This project aims to develop hydrogels and organogels based on Janus dendrimers

Watkins (PI)

04/01/17-03/31/23

CAREER: Elucidating the role of sigma-hole interactions in advanced functional materials

The goal of this study is two-fold: (1) develop new hybrid (i.e., alternating and fused furan-thiophene) materials for semiconducting devices and (2) incorporate halogen bonding into the organic conjugated molecules to induce highly directional 2D morphologies

Watkins (PI)

09/01/22-08/31/25

Ionic Liquid-Coated NIR-II Polymer Conjugates as Targeted Brain Theranostics

This project aims to study how ionic liquid coated polymer nanoparticles 'hitchhiking' on erythrocytes and deliver cargo to the brain.

Morgan (PI)

10/01/18-09/31/23

National Science Foundation: Mississippi NSF EPSCoR RII-Track 1: Center for Emergent Molecular Optoelectronics (CEMOs)

This project aims to overcome these barriers by generating the knowledge needed to extend the utility of organic π -conjugated oligomers and polymers into the infrared region (IR).

Role: Senior Personnel, Scientific Thrust Leader: Bio-imaging concentration

1. Associate Editor ACS Omega (2023-present)

2. Advisory board member for **Women in Supramolecular Chemistry** (2020-present)
3. Member of **Sigma Xi Scientific Research Honor Society** (2019-present)
4. Member of the **Society of STEM Women of Color, Inc.** (2015-present)
5. Co-advisor for the University Chapter of **National Organization of Black Chemist and Chemical Engineers (NOBCChE)** as well as a professional member of the organization (2015-present)
6. Member of the **University Women in STEM Committee**, an initiative to increase the number of minorities and women in STEM-related fields (2014-present)
7. Member of the **American Chemical Society, Division of Organic Chemistry** (2012-present); Secretary for the Local **American Chemical Society** Section; Ole Miss, L420 (2015-2016)
Member-at-Large **Division of Colloid and Surface Chemistry** (2020-present) and Programming Committee **Division of Polymeric Materials Science and Engineering** (2021-present)

Postdoctoral Advising (3) – Daniel G. Abebe, Sivaraman Balasubramaniam, Anjua Kulkarni

Thesis/Dissertation Advising (12) – Jon Steven Dal Williams, Briana Simms, Indika Chandrasiri, Dilan Karunathilaka, Mahesh De Silva, Sajith Vijayan, Tharindu Ranathunge, Nicholas Sparks, Blaine Derbigny, Angel Weather, Thejana Gunathilake, Mukherjee Shreyasi, Maryam Ghazala, Ioana Cosmin

Thesis/Dissertation Committee (9) – Christine Hamadani, Jonathon Watson, Christine Curiac, Sarah Johnson, Sweta Adhikari, Adithya Peddapuram, Roberta Rodrigues, Tanya Jones, April Steen

Undergraduate Research Supervision (20) – Erin Hundall, Christina Wurm, Jamey Wilson, Ngoc Le, Suong Nguyen, Christopher Tate, Justin McCray, Sweta Adhikari, William Rieger, Nicholas Sparks, Pu Ouyang, Abigail Barker, Chinwe Udemgba, Azizah Parker, Jordan Varma, Rashandra Rankin, Brianna Sumler, Clarissa Prince, Allison Rattey

High School Research Supervision (10) – Zaria Cooper, Alisha Burch, Violet Jira, Taniya Bland, Samantha Anderson, Mia Riddley, Shuchi Patel, Takiya Moore, Tia Wilson, Ayana Love