

BUKOLA FLORENCE OGUNYEMI

410 South 17th Street 37916 Knoxville, Tennessee, USA.
865-684-3388 | Ogunyemibukola8@gmail.com | [LinkedIn](#)

PROFESSIONAL SUMMARY

Ph.D. Candidate in Chemistry (expected May 2027) with five years of hands-on experience in multistep synthesis, reaction optimization, and analytical characterization, backed by Good Manufacturing Practice (GMP) quality-control experience in pharmaceutical manufacturing. Research expertise spans organic synthesis, catalysis, organometallic chemistry, and molecular sensing, with demonstrated ability to synthesize, characterize, and optimize complex organic and organometallic compounds for catalytic and sensing applications. Independently designed and led projects in catalysis and chemical sensing that have produced four peer-reviewed publications. A collaborative and adaptable team member who contributes to multidisciplinary projects, maintains rigorous technical documentation, and is committed to driving innovation through disciplined research and continuous professional development.

Career interests: Industry roles in R&D, process chemistry, analytical and quality, or sensing and materials technologies within the chemical, pharmaceutical, materials, and instrumentation sectors.

CORE COMPETENCIES

Synthesis & Process	Multistep organic and organometallic synthesis Ligand and catalyst design Reaction optimization and scope studies Schlenk and inert-atmosphere technique Flash chromatography and recrystallization
Analytical Methods	High Performance Liquid Chromatography (HPLC) Nuclear Magnetic Resonance (NMR) UV-Vis and fluorescence spectroscopy Fourier Transform Infrared Spectroscopy (FTIR) Mass spectrometry (ESI, MALDI, DART) X-ray crystallography Column chromatography
Data & Software	ChemDraw Excel R Tableau GraphPad Prism Word and PowerPoint
Professional	Technical writing and reporting Training and mentoring Cross-functional collaboration · Project leadership Safety leadership

EDUCATION

Ph.D., Inorganic Chemistry	Aug 2022 - May 2027 (expected)
<i>University of Tennessee, Knoxville, TN, USA · GPA 4.0/4.0</i>	
• Dissertation: Ligand Effects on Metal Complex Reactivity and Molecular Recognition in Rhodium and Copper Systems for Applications in Catalysis and Sensing	
B.Sc., Pure and Applied Chemistry	Feb 2016 - Feb 2020
<i>University of Ibadan, Ibadan, Nigeria · GPA 6.3/7.0 · Dean's Roll of Honor, 2017 and 2018</i>	

RESEARCH EXPERIENCE

Graduate Research Assistant	Aug 2022 - Present
<i>Department of Chemistry, University of Tennessee, Knoxville, TN, USA</i>	
• Developed and executed multistep synthetic routes (thioetherification, oxidation, ligand exchange) to functionalized ligands and Rh(II) paddlewheel complexes under Schlenk and Soxhlet conditions; troubleshoot low-yielding ligand-exchange steps and identified a trifluoroacetate precursor that raised bis-substituted product yield to 53-75% while suppressing mono-substituted byproducts.	
• Led a structured optimization of a Rh(II)-catalyzed Si-H insertion, screening solvent, base, temperature, catalyst, and loading across 16 conditions to improve yield from 12% to 78%. Established robustness across 10 substrates with yields quantified by ¹ H NMR against internal standards.	
• Developed and validated a UV-Vis method for detecting an organophosphate nerve-agent simulant, establishing limits of detection from calibration curves and assessing specificity against eight interferents under competitive conditions.	

- Quantified ligand association constants by UV-Vis titration with nonlinear regression (GraphPad Prism) and reconciled solution data with single-crystal X-ray structures to build structure-property relationships that guided ligand selection.
- Designed and synthesized Cu(II)-dansyl fluorescent probes for nerve-agent simulant and set their detection limits by fluorimetry analysis.
- Confirmed identity and purity of intermediates, products, and complexes by $^1\text{H}/^{13}\text{C}/^{31}\text{P}$ NMR, HRMS (ESI, MALDI, DART), FT-IR, UV-Vis, and SCXRD; purified by automated flash chromatography and recrystallization method. Handled diazo intermediates, organophosphate simulants, and air-sensitive complexes under appropriate controls.

Undergraduate Research Assistant

Oct 2019 - Feb 2020

Department of Chemistry, University of Ibadan, Nigeria

- Synthesized a series of Cu(II) and Ni(II) mixed-ligand complexes and confirmed their composition and purity by mass spectrometry, FTIR, and UV-Vis spectroscopy.
- Screened the complexes for antimicrobial activity against bacterial and fungal strains, correlating activity with metal and ligand structure to identify the most promising candidates.

INDUSTRY EXPERIENCE

Quality Control Intern

Apr 2019 - Jun 2019

MOPSON Pharmaceutical Limited, Lagos, Nigeria · Reported to the quality assurance analyst

- Tested tablet and capsule products against specifications by UV and HPLC assay, dissolution, pH, hardness, friability, loss on drying, and moisture content, generating release data used to confirm quality and regulatory compliance.
- Performed pre-production assays to verify that formulations met specification before batch scale-up, providing data that informed manufacturing and process decisions.
- Calibrated the UV spectrophotometer, HPLC, dissolution, pH, hardness, and friability instruments used for testing, and maintained complete analytical records in support of cross-functional Quality Assurance (QA) activities.

Quality Control Intern

Feb 2018 - Apr 2018

CHI Pharmaceutical Limited, Lagos, Nigeria · Reported to quality assurance analyst

- Prepared, standardized, and labeled reagent and working solutions used in daily finished-product testing of tablets and capsules.
- Collected in-process and finished-product samples from production lines and logged them for analysis, maintaining traceability from batch to result.
- Assisted the laboratory analyst with routine release testing and instrument calibration, gaining foundational training in SOPs, GMP documentation, and laboratory safety.

TEACHING EXPERIENCE

Graduate Teaching Assistant

Aug 2022 - Present

Department of Chemistry, University of Tennessee, Knoxville, TN, USA

- Coordinated and instructed over 50 undergraduates in Foundation of Organic Chemistry Laboratory. Supervised experiments involving synthesis, purification, and characterization of organic compounds discussed in lectures.
- Coordinated and supervised 100+ undergraduates in General Chemistry Laboratory, covering the basic techniques of analyzing data from chemical reactions and emphasizing safe technique and accurate record-keeping.

Graduate Teaching Assistant

July 2021 - June 2022

Department of Industrial Safety & Environmental Technology, Petroleum Training Institute, Effurun, Nigeria

- Contributed to the design of semester syllabi and curricula in industrial safety and environmental technology, aligned with program learning objectives.
- Coordinated and delivered undergraduate tutorial sessions reinforcing lecture material on industrial safety and environmental practice.

- Proctored and graded examinations, upholding assessment integrity and maintaining accurate student records.

PUBLICATIONS & PRESENTATIONS

- **Ogunyemi, B.**; Day, B.; Darko, A. Chromogenic and Fluorogenic Detection of diethyl chlorophosphate (DCP) with Dansyl Functionalized Copper(II) Complexes. *Inorganic Chemistry* (under review).
- Moore, D.; Fussell, E.; Bennin, E.; **Ogunyemi, B.**; Kline, N.; Darko, A. Selective Sensing of Nerve Agent Simulant via Dirhodium(II,II) Paddlewheel Complexes Bearing Pendant Hemilabile Thioether Ligands. *ACS Omega* **2026**, DOI 10.1021/acsomega.5c10394.
- Moore, D.; **Ogunyemi, B.**; Nalaoh, P.; Darko, A. Effect of Tethered Sulfur Ligands on the Association Constants of Dirhodium(II,II) Paddlewheel Complexes. *Eur. J. Inorg. Chem.* **2024**, 27, e202300600.
- Abshire, A.; **Ogunyemi, B.**; Darko, A. Rh(II)-Catalyzed Si-H Insertion with Nosyl-Hydrazone-Protected Aryl Donor Diazo Compounds. *ACS Omega* **2023**, 8 (41), 38005–38012.
- Oral: **Ogunyemi, B.**; Blake, D.; Darko, A. Chromogenic and Fluorogenic Detection of diethyl chlorophosphate (DCP) with Dansyl Functionalized Copper(II) Complexes. NOBCChE National Conference, 2026.
- Oral: **Ogunyemi, B.**; Blake, D.; Darko, A. Fluorogenic and Chromogenic Cu-dansyl Complexes as Probes for Organophosphorus Nerve Agent Detection. Southeastern Regional Meeting of the ACS (SERMACS), 2025.
- Poster: Abshire, A.; **Ogunyemi, B.**; Darko, A. Rh(II)-Catalyzed Si-H Insertion with Nosyl-Hydrazone-Protected Aryl Donor Diazo Compounds. NOBCChE National Conference, 2024.
- Poster: Abshire, A.; **Ogunyemi, B.**; Darko, A. Rh(II)-Catalyzed Si-H Insertion with Nosyl-Hydrazone-Protected Aryl Donor Diazo Compounds. Catalysis Innovation Consortium, 2023.

LEADERSHIP & SERVICE

Volunteer Mentor, EduFurther (Non-Profit Organization) 2024 - Present

- Mentor undergraduates from diverse backgrounds on securing fully funded graduate scholarships, guiding them through application strategy, CV writing, and compelling personal statements.
- Recognized among the organization's top five mentors for the highest number of mentoring sessions and hours delivered.

Vice President, NOBCChE Chapter, University of Tennessee 2025 - 2026

- Lead executive officer for a 50+ member chapter; secured travel funding, co-organized a Spallation Neutron Source tour at Oak Ridge National Laboratory (Feb 2026), and represented the chapter at national conferences.

Secretary, Association of Chemistry Graduate Students, University of Tennessee 2025 - 2026

- Manage communications and records; coordinate student-department head meetings and initiated cross-departmental workshops.

Graduate Student Senate Representative, University of Tennessee 2024 - 2025

- Advocated for graduate resources and policy

Science Fair Judge & Event Proctor 2022 and 2026

- Judged four regional and university science fairs (BSEF, EURECA, SASEF, Ohio Virtual Science Day, (2026)
- Proctored the UTK Chemistry Research Open House (2023) and Tennessee State Science Olympiad (2022).

AWARDS & GRANTS

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| • Graduate Fellowship for Achievement in Inorganic Chemistry, Department of Chemistry, UTK | 2026 |
| • Advancing Science Conference Grant, NOBCChE | 2026 and 2025 |
| • Graduate Student Senate Academic Support Award, UTK | 2025 and 2024 |
| • Outstanding Ph.D. Candidate Award, Department of Chemistry, UTK | 2024 |

PROFESSIONAL AFFILIATIONS

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| • American Chemical Society (ACS) | 2023 - Present |
| • NOBCChE | 2023 - Present |
| • Association of Chemistry Graduate Students (ACGS), UTK | 2022 - Present |