

# Ernest Bennin

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## OVERVIEW

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Ph.D. scientist with demonstrated expertise in enantioselective catalysis, chemical sensing of organophosphorus nerve agent simulants, chemical synthesis, spectroscopy, chemical separation, DFT modeling and analytical instrumentation. Skilled at translating complex research into real-world applications and fostering collaborative, cross-functional teams to drive innovation and impact.

## EDUCATION

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<b>The University of Tennessee, Knoxville</b> Doctor of Philosophy, Analytical Chemistry Advisor: Professor Ampofo K. Darko	Aug 2022- Expected May 2027
<b>Kwame Nkrumah University of Science and Technology</b> Bachelor of Science in Chemistry Advisor: Professor Marian A. Nkansah	Aug 2017- Nov 2021 GPA 3.69/4.00

## RECOGNITIONS

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- NSF-Center for Computer Assisted Synthesis Professional Development Award Aug 2025
- NOBCChE Advancing Science Conference Grant Jun 2025
- NSF-Center for Computer Assisted Synthesis Professional Development Award May 2025
- The Graduate Student Senate Travel Award Oct 2024
- UTK Center for Integration of Research Teaching and Learning Certificate Nov 2023
- FY23 Grad School Fellowship Aug 2022-present
- Graduate Teaching/Research Assistantship Award Aug 2022-present
- GETFUND Scholarship, Ghana (Awarded to brilliant student) Aug 2017-Nov 2021

## WORK AND RESEARCH EXPERIENCE

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<b>Chemistry Graduate Research Assistant</b> <i>The University of Tennessee, Knoxville</i>	Nov 2023- Present
<ul style="list-style-type: none"><li>• Designed and synthesized tethered ligand to modify dirhodium paddlewheel complexes for improved axial coordination and enantioselectivity in diazo-mediated cyclopropanation reactions.</li><li>• Synthesized dirhodium paddlewheel complexes to explore new sensing approaches for organophosphorus nerve agent simulant (DCP), resulting in one published and one submitted manuscript.</li><li>• Collaborated with interdisciplinary teams, including NSF-CCAS, CCDC-CBC, to solve detection challenges and advance sensor and catalysts development.</li><li>• Mentored undergraduate students in essential laboratory techniques, chemical synthesis, separations, and guided them in scientific communication through presentations, poster design and reports writing</li><li>• Conducted regular lab inspections and equipment checks to identify and address potential risks, resulting in improved safety audit scores.</li><li>• Coordinated waste disposal to maintain regulatory compliance and streamline lab operations</li><li>• Organized semester-based academic and social activities for Darko research group to strengthen collaboration, improve research engagement, and foster a positive lab culture.</li><li>• Scheduled meetings and team-building events to promote scientific discussion, peer learning and professional development.</li></ul>	

<b>Undergraduate Research Assistant</b> <i>Department of Chemistry, Kwame Nkrumah University of Science and Technology</i>	May 2021- Aug 2022
<ul style="list-style-type: none"><li>• Conducted groundwater quality analysis to assess contamination levels and public health risks in the Offinso-North District, which informed recommendations for safer water use.</li></ul>	

- Collaborated on heavy metal pollution studies in soil from the Oti-Dompoease dumpsite to evaluate environmental impact and support regional pollution mitigation efforts.

**Assisted licensed pharmacists as an intern**

May 2018-Aug 2018 / May 2019-Aug 2019

*Offinso-North District Government Hospital, Ashanti region-Ghana*

*Supervisor: Dr. Sampany Kese*

- Prepared and dispensed prescription medication under supervision to ensure patient safety and dosage accuracy.
- Packaged and labelled medications with clear instructions to enhance patient compliance and reduce medication errors.
- Assisted patients with inquiries and transactions to improve customer service and streamline pharmacy operations.
- Operated pharmacy software to manage inventory and maintain records for accurate reporting and regulatory compliance.
- Formulated specialized medications (e.g. ointments and liquids) per pharmacist directives to support diverse treatment needs.

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**TEACHING EXPERIENCE**

**Head of Teaching Assistants**

May 2023- Jul 2023

*Department of Chemistry - The University of Tennessee, Knoxville*

*Coordinator: Dr. Nahla Abu Hatab*

- Supervised and supported a team of teaching assistants during laboratory sessions (Foundation of organic chemistry Lab, CHEM 269) to ensure accurate demonstration and student comprehension.
- Assisted students and teaching assistants with technical questions to promote lab safety and success.
- Monitored in-person examinations and graded assessments to maintain academic integrity and timely feedback.

**Chemistry Teaching Assistant**

<sup>a</sup>*The University of Tennessee*

Aug 2025- present

<sup>b</sup>*The University of Tennessee*

Jan 2023- May 2023

<sup>c</sup>*Kwame Nkrumah University of Science and Technology*

May 2021- Aug 2022

*Coordinators: Dr. Carroll Xian<sup>a</sup>, Dr. Nahla Abu Hata<sup>b</sup>, Dr. Osei Akoto<sup>c</sup>*

- Demonstrated chemistry labs (Analytical Chemistry V Lab, CHEM 369, Analytical Chemistry VI Lab, CHEM 370, General Chemistry I Lab, CHEM 123 and Foundation of organic chemistry Lab, CHEM 269) to undergraduate students, helping connect theory with practice for deeper understanding.
- Graded reports and examinations to provide students with constructive feedback and performance insight.
- Organized tutorials and problem-solving sessions to reinforce lecture content and improve exam preparation.
- Supported lecturers with instructional duties, enhancing the delivery and effectiveness of course (Instrumental Methods of Analysis II, CHEM 461 and Environmental Chemistry, CHEM 462) content.

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**SELECTED PUBLICATIONS**

- Ernest Bennin. "[How federal research funding transformed my path](#)." Knox news, Jan. 15, 2026. (Op-Ed)
- Desiree Moore, Eric D. Fussell, [Ernest Bennin](#), Bukola Ogunyemi, Neal D. Kline\*, and Ampofo Darko\*. Selective Sensing of Nerve Agent Simulant via Dirhodium(II,II) Paddlewheel Complexes Featuring Pendant Hemilabile Thioether Ligands. ACS Omega. **2026** submitted, manuscript ID ao-2025-10394v
- Eric D. Fussell, [Ernest Bennin](#), Neal D. Kline\*, Sarah S. Hirshbeck, and Ampofo Darko\* Chromogenic detection of the organophosphate nerve agent simulant DCP mediated by rhodium(II, II)paddlewheel complexes. ACS Sensors. **2024**, 9(5), 2325-2333
- Nkansah, M. A., Kofi Adzibolosu, A. S., Kumah, M. E., [Bennin, E.](#), Adrewie, D. Heavy Metal Pollution Studies of Soil from the Oti-Dompoease Dumpsite in Kumasi. Fine Chemical Engineering. **2024**, 5, 397-413
- [Ernest Bennin](#), Ryan O'Connell, Cristian Zavala, Olaf Wiest\*, and Ampofo Darko\*. Strategic Ligand Design for Modulating Axial Sites in Dirhodium Catalysts: Toward Enhanced Asymmetric Cyclopropanation. Manuscript in progress, expected to be submitted in February 2026.

## **SELECTED PRESENTATIONS**

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1. **Poster Presentation**, Chromogenic Detection of the Organophosphorus Nerve Agent Simulant DCP Mediated by Rhodium(II,II) Paddlewheel Complexes. National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) conference. Atlanta, GA. Sep. 2025.
2. **Poster Presentation**, Asymmetric cyclopropanation on dirhodium complexes with tethered axially coordinated chiral ligands. (a) American Chemical Association, Division of Organic Chemistry's National Organic Symposium, Troy, NY. Jun. 2025. (b) National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) conference. Orlando, FL. Sep. 2024.
3. **Poster Presentation**, DFT modelling of dirhodium complexes with tethered axially coordinated chiral ligands for asymmetric cyclopropanation. NSF-Center for Computational and Assisted Synthesis. UC-Davies, LA. Jun. 2024.
4. **Oral Presentation**, Asymmetric cyclopropanation on dirhodium complexes with tethered axially coordinated chiral ligands. (a) 3<sup>rd</sup> Year seminar, The University of Tennessee, Knoxville, TN, May 2025 (b) Candidacy examination, The University of Tennessee, Knoxville, TN, Mar. 2024.
5. **Poster Presentation**, Determination of physicochemical parameters, nutrients, heavy metal content, and human health risk assessment of groundwater from the Offinso-North District of Ashanti Region, Ghana. (a) Undergraduate poster session, Department of Chemistry, KNUST, Kumasi, Ghana 2021 (b) Ghana Science Association, College of Science, KNUST, Kumasi, Ghana 2021.
6. **Oral Presentation**, Determination of physicochemical parameters, nutrients, heavy metal content, and human health risk assessment of groundwater from the Offinso-North District of Ashanti Region, Ghana. Undergraduate project defense, Department of Chemistry, KNUST, Kumasi, Ghana 2021.

## **SKILLSET**

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- Organic reaction setups, Inorganic reaction setups, Crystal growth, Schlenk and glovebox techniques, manual and automated flash column chromatography, crystallization, recrystallization, and HPLC setup and analysis.
- Ultraviolet-Visible Spectroscopy, Nuclear Magnetic Resonance (NMR (<sup>1</sup>H, <sup>13</sup>C, <sup>19</sup>F, <sup>31</sup>P)), Fluorescence spectroscopy, Infrared (IR) spectroscopy, Circular dichroism.
- Microsoft Office, Gaussian, Data analysis, MestReNova, ChemDraw.

## **SOFT SKILLS**

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- Leadership, Written and Oral communication, Problem-solving, Teamwork, Organization, Project management, Creativity, Adaptability.

## **LEADERSHIP ROLES**

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| • <b>ASCG committee member</b> for NOBCChE conference planning, Cincinnati, OH      | Feb 2026          |
| • <b>President-</b> NOBCChE Chapter, University of Tennessee                        | Mar 2025-Present  |
| • <b>President-</b> Ghana Students' Association, University of Tennessee, (GSA-UTK) | Aug 2025-Present  |
| • <b>Activity Coordinator-</b> Darko Research Group, University of Tennessee        | Jan 2023-Present  |
| • <b>Deputy Safety Officer-</b> Darko Research Group, University of Tennessee.      | Aug 2023-May 2024 |

## **PROFESSIONAL AFFILIATIONS AND MEMBERSHIP**

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| • National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) | Mar 2025-Present |
| • American Chemical Society (ACS)   | Feb 2025-Present |
| • NSF Center for Computer Assisted Synthesis (C-CAS)  | Jan 2023-Present |
| • Association of Chemistry Graduate Students (ACGS)   | Aug 2022-Present |