

Faculty Name: Dr. Oluwatoyin A. Asojo

Dr. Asojo investigates the chemistry of life processes, including deciphering the underlying mechanisms and structural basis of immune and suppression evasion by parasites, infectious agents, or host cells in cancer or reproduction as a preamble for the rational design of vaccines and therapeutics. Asojo is also interested in improving scientific literacy and developing and deploying evidence-based methods to increase scientific identity. She is passionate about neglected diseases, under-served populations, and research capacity building.

Ongoing projects include:

- 1) Evidence-based interventions to plug leaks in the biomedical training pipeline
- 2) Vaccine and therapeutics development for NTDs
- 3) Structure-function analysis of infectious disease proteins: SSGCID
- 4) Studying environmental justice and inequities using high-spatial-resolution remote sensing measurements of air pollution, social science collaboration with atmospheric science.

Keywords: Macromolecular Crystallography, Capacity building, Neglected and emerging diseases, rational therapeutics discovery, cancer, protein chemistry, biophysics, methods development

Student Participant(s): Ananda Turner, Krishelle Jackson, and CHE 114/215/314/315/414/415 Fall 2022 Cohort of 52 students with Chakafana

Recent Dissemination:

Peer-Reviewed Publications 2021-2022

HU Students are in red and underlined, and HU faculty are in blue.

1. Odoya, E.M.*, Edosomwa, E.U., Iribhogbe, O.I. Damina, A.A., **Asojo O.A.** (2021) Intestinal schistosomiasis in an apparently healthy rural population in Bayelsa State, Nigeria, *African Journal of Clinical and Experimental Microbiology* 22 (2) 187-195 DOI: [10.4314/ajcem.v22i2.11](https://doi.org/10.4314/ajcem.v22i2.11)
2. **Ghebreyessus, K., Ndip, E.M., Waddell, M.K., Asojo, O. A., and Njoki, P.N.*** Cultivating Success through Undergraduate Research Experience in a Historically Black College and University *Journal of Chemical Education* Article ASAP DOI: 10.1021/acs.jchemed.1c00416
3. **Davidson, J., Nicholas, K., Young, J.,** Conrady, D. G., Mayclin, S., Subramanian, S., Staker, B.L., Myler, P.J., and **Asojo, O. A*** Crystal structure of a putative short-chain dehydrogenase/reductase from *Paraburkholderia xenovorans* Acta Cryst. (2022). F78 (Pt 1), 25–30 <https://doi.org/10.1107/S2053230X21012632>
4. **Porter, I., Neal, T., Walker, Z., Hayes, D., Fowler, K., Billups, N., Rhoades, A., Smith, C., Smith, K.,** Staker, B.L., Dranow, D. M., Mayclin, S. J, Subramanian, S., Edwards, T.E., Myler, P.J., and **Asojo, O. A*** Crystal structures of FolM alternative dihydrofolate reductase 1 from *Brucella suis* and *Brucella canis* Acta Cryst. (2022). F78 (Pt 1), 31–38 <https://doi.org/10.1107/S2053230X21013078>
5. El Atab, O., Kocabey, A.E., **Asojo, O. A***, Schneiter, R.*, Prostate secretory protein 94 (PSP94) inhibits sterol-binding and export by the mammalian CAP protein CRISP2 in a calcium-sensitive manner. *Journal of Biological Chemistry* (2022), DOI: <https://doi.org/10.1016/j.jbc.2022.101600>.
6. **Alenazi, J.;** Mayclin, S.; Subramanian, S.; Myler, P. J.; **Asojo, O. A***, Crystal structure of a short-chain dehydrogenase/reductase from *Burkholderia phymatum* in complex with NAD. Crystal structure of a short-chain dehydrogenase/reductase from *Burkholderia phymatum* in complex with NAD. Acta Cryst. (2022). F78 (Pt 2), 52-58. DOI: [10.1107/S2053230X22000218](https://doi.org/10.1107/S2053230X22000218)
7. **Beard, D.K.,** Subramanian, S., Abendroth, J., Dranow, D.M., Edwards, T. E., Myler, P.J.; **Asojo, O.A***, Crystal structure of betaine aldehyde dehydrogenase from *Burkholderia pseudomallei*. Acta Cryst. (2022). F78 (Pt 2), 45-51. [10.1107/S2053230X21013455](https://doi.org/10.1107/S2053230X21013455)
8. **Beard, D.K., Bristol S., Cosby K., Davis A, Manning C., Perry L., Snapp L., Toy A., Wheeler K., Young, J.,** Staker, B., Arakaki, T.L., Abendroth, J., Subramanian, S., Edwards, T.E., Myler, P.J.,

- Asojo, O. A.*** (2022) Crystal structure of a hypothetical protein from *Giardia lamblia*. *Acta Cryst.* F78 (Pt 2),59-65. doi:10.1107/S2053230X21013595, corrig. [10.1107/s2053230x22001704](https://doi.org/10.1107/s2053230x22001704)
9. **Maddy, J.**, Staker, B., Subramanian, S, Abendroth, J., Edwards, T.E., Myler, P.J., Hybiske_K., **Asojo, O. A.*** Crystal structure of an inorganic pyrophosphatase from *Chlamydia trachomatis* D/UW-3/Cx, *Acta Cryst.* F78 (Pt 3), 135-142 <http://doi.org/10.1107/S2053230X22002138>
 10. **Brooks, L.**, Subramanian, S, Dranow D., Mayclin S., Myler, P.J., **Asojo, O. A.*** (2022) Crystal structures of glutamine-tRNA synthase from *Elizabethkingia anopheles* and *E. meningosepticum*, *Acta Crystallographica Section F* DOI: [10.1107/S2053230X22007555](https://doi.org/10.1107/S2053230X22007555)
 11. González-López, C., Chen, W.-H., Alfaro-Chacón, A., Villanueva-Lizama, L. E., Rosado-Vallado, M., Ramirez-Sierra, M. J., Teh-Poot, C. F., Pollet, J., **Asojo, O.**, Jones, K. M., Hotez, P. J., Elena Bottazzi, M., and Cruz-Chan, J. V. (2022) A novel multi-epitope recombinant protein elicits an antigen-specific CD8+ T cells response in Trypanosoma cruzi-infected mice. *Vaccine* DOI: [10.1016/j.vaccine.2022.09.068](https://doi.org/10.1016/j.vaccine.2022.09.068)

Book Chapter

Asojo, O.A. (2021). The Dysfunctional Interplay between Health, Ethnicity, Religion, and Underdevelopment in Nigeria. In. A.O. Asojo & T. Falola (Eds.). *African Humanity Creativity, Identity and Personhood* (pp. 359-368). North Carolina, Durham: Carolina Academic Press. ISBN 978-1-5310-1756-9 (August 2021)

Published conference proceedings since 2021

- 1) Y. E. Cherner*, **O. Asojo**, P. I. Cherner, Yi He and H. Garmestani Adaptable virtual X-ray laboratories for online teaching, learning and authentic practice' *Acta Cryst.* (2021). A77, C674-C675 <https://scripts.iucr.org/cgi-bin/paper?S0108767321090218>
- 2) **Asojo, O. A.*** Covid-proofing biochemistry and engaging diverse students with crystallography research *Acta Cryst.* (2021). A77, C679 <https://scripts.iucr.org/cgi-bin/paper?S0108767321090176>
- 3) **Asojo, O.A.** Engaging Diverse Students with Crystallography Research *Acta Cryst.* (2021). A77, a98 <https://scripts.iucr.org/cgi-bin/paper?S0108767321099013>

Faculty Name: Dr. Graham Chakafana

Dr. Chakafana's research focuses on the structural and functional characterization of proteins involved in human diseases such as malaria and cardiovascular disease. The long-term goal of the research is to target vital proteins in novel drug discovery and biomarker identification.

Keywords: Protein, Structure, Function, Drug discovery

Student Participant(s): CHE 114/215/314/315/414/415 CUREs Fall 2022 Cohort 52 students with Asojo

Recent Dissemination:

Peer-Reviewed Publications 2021-2022

1. **Chakafana, G.**, Mudau, P. T., Zininga, T., & Shonhai, A. (2021a). Characterisation of a unique linker segment of the Plasmodium falciparum cytosol localised Hsp110 chaperone. *Int J Biol Macromol*, 180, 272-285.
2. **Chakafana, G.**, Mudau, P. T., Zininga, T., & Shonhai, A. (2021b). Supporting data on characterisation of linker switch mutants of Plasmodium falciparum heat shock protein 110 and canonical Hsp70. *Data Brief*, 37, 107177.
3. **Chakafana, G.**, & Shonhai, A. (2021). The Role of Non-Canonical Hsp70s (Hsp110/Grp170) in Cancer. *Cells*, 10(2).
4. **Chakafana, G.**, Spracklen, T. F., Kamuli, S., Zininga, T., Shonhai, A., Ntusi, N. A. B., et al. (2021). Heat Shock Proteins: Potential Modulators and Candidate Biomarkers of Peripartum Cardiomyopathy. *Front Cardiovasc Med*, 8, 633013. DOI: [10.3389/fcvm.2021.633013](https://doi.org/10.3389/fcvm.2021.633013)
5. Makumire, S., Dongola, T. H., **Chakafana, G.**, Tshikonwane, L., Chauke, C. T., Maharaj, T., et al. (2021). Mutation of GGMP Repeat Segments of Plasmodium falciparum Hsp70-1 Compromises Chaperone Function and Hop Co-Chaperone Binding. *Int J Mol Sci*, 22(4).
6. Spracklen, T. F., Chakafana, G., Schwartz, P. J., Kotta, M. C., Shaboodien, G., Ntusi, N. A. B., et al. (2021). Genetics of Peripartum Cardiomyopathy: Current Knowledge, Future Directions and Clinical Implications. *Genes (Basel)*, 12(1).
7. Thienemann, F., Chakafana, G., Pineiro, D., Pinto, F. J., Perel, P., Singh, K., et al. (2021). WHF Position Statement on COVID Vaccination. *Glob Heart*, 16(1), 29.

Faculty Name: Dr. Kesete Ghebreyessus

Dr. Ghebreyessus's research focuses on the design and synthesis of novel photoresponsive hybrid organic-inorganic materials that can be used to address biomedical, energy, and nanotechnology-related challenges. The ongoing research activities are inspired by the use of light as a means to achieve desired structure-function relationships of photoactive materials. My current research program comprises three-interrelated concepts:

- 1) photo-responsive supramolecular soft materials and photomechanical actuators,
- 2) hybrid organic-inorganic materials for catalytic and biological applications
- 3) nanoparticle synthesis and characterization.

The current research activities have potential applications in photoswitchable catalysis, DNA binding and photo-activated chemotherapy, removal of toxic metals and environmental remediation, photomechanical actuators, and radiation detection.

Keywords: nanoparticle synthesis, photoswitchable catalysis, DNA binding, and photo-activated chemotherapy, environmental remediation, hybrid organic-inorganic materials

Current Student Participants: Jazz Geter and Alexandra Jefferson

Recent Dissemination:

Publications 2021-2022

1. Uba, I., Geddis, D., Ghebreyessus, K., Hömmerich, U., Dumas, J. "A Study of Wave Confinement and Optical Force in Polydimethylsiloxane-Arylazopyrazole Composite for Photonic Applications" *Polymers*, **2022**, *14*, 896. <https://doi.org/10.3390/polym14050896>.
2. Ghebreyessus, K.; Ndip, E.; Waddell, M.; Asojo, O.; **Njoki, P. N.*** Cultivating Success through Undergraduate Research Experience in a Historically Black College and University. *Journal of Chemical Education*. **2022**, *99*, 307-316. <https://doi.org/10.1021/acs.jchemed.1c00416>
3. Yia, M.; Guoa, J.; Hea, H.; Tana, W.; Harmon, N.; **Ghebreyessus, K.**; Xu, B. "Phosphobisaromatic motifs enable rapid enzymatic self-assembly and hydrogelation of short peptides" *Soft Matter*, **2021**, *17*, 8590-8594 <https://doi.org/10.1039/D1SM01221E>
4. **Ghebreyessus, K.**; Uba, I.; Geddis, D.; Hommeric, U. Solid-state photoswitching in arylazopyrazole-embedded polydimethylsiloxane composite thin films" *J. Solid State Chem.* **2021**, *303*, 122519. <https://doi.org/10.1016/j.jssc.2021.122519>
5. Uba, I.; **Ghebreyessus, K.**; Geddis, D.; Hommeric, U. "Tunable Optoelectronic Properties of Polydimethylsiloxane-Arylazopyrazole Flexible Composite" *Conference proceeding IEEE SOUTHEASTCON 2021*, 9401853 DOI: [10.1109/SoutheastCon45413.2021.9401853](https://doi.org/10.1109/SoutheastCon45413.2021.9401853)
6. Hommeric, U.; Barnett, J.; Kabir, A.; Ghebreyessus, K.; Hampton, K.; Uba, S.; Uba, I.; Geddis, D.; Yang, C.; Trevedi, S. B.; Fraden, S.; Ali Aghvami, S. "Comparative steady-state and time-resolved emission spectroscopy of Mn-doped CsPbCl₃ perovskite nanoparticles and bulk single crystals for photic applications" *Proceeding of SPIE-the international society for optical engineering* **2021**, 11682. <https://doi.org/10.1117/12.2582217>

Book Chapter

Cooper, S. M.; Ha, D.; Candace Snow-Davis, C.; Watson, N.; Raymond E. Samuel, R. E.; **Ghebreyessus, K.**; Du, C.; Huang, Y.; Li, F. "Stimuli-Responsive Nanomedicine", *Book chapter*, **2021** page 44. eBook ISBN9780429295294.

Presentations

1. **Ghebreyessus, K.**; Sallee, A. "Photoswitchable Multicomponent Zinc(II)-specific metallohydrogels" National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCHE) Annual Collaborate Conference, May 27, 2021 (Virtual).

2. **Brow, M.;** Ghebreyessus, K. “Modeling studies to improve the photoswitching performance of azoheteroarenes” National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) Annual Collaborate Conference, May 27, 2021 (virtual).
3. **Ghebreyessus, K.** Remote Teaching of the General Chemistry labs during COVID-19” National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE), January 28, 2021 (Virtual)
4. **Ghebreyessus, K.;** Arrington, D. “Arylazopyrazole-functionalized photoswitchable ruthenium(II)-arene complexes” ACS National Meeting, April 05 - 28, 2021 (virtual).

Faculty Name: Dr. Insu Hahn

Dr. Hahn's research focuses on the optimum structural characterization and thermochemistry of biochemical molecules by computational approximations and a series of novel "Omics" studies related to disease cells of animals or plants. Ongoing projects include:

- 1) High-level computational approximations of furin substrate structures in mutated SARS-COVID-2 spike proteins at S1/S2.
- 2) Molecular modeling for mixed systems of bio-chiral dopants and nematic liquid crystals

Student Participant(s): A. Coley, S. S. Ebron, C. Smith, M.A. Gatling, T. German, C. Gibson, S. Turner, P. Makori

Keywords: theoretical approximations, furin substrate, thermochemistry, biochiral dopants, nematic liquid crystals

Recent Dissemination: Journal publication(s) or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021 ([HU Students](#)):

1. **Adams MJ, Roberts B**, and Hahn I*, Theoretical thermochemistry of simplified metal-cortisol antibody complex models for biosensors containing metal substrates, *Journal of Undergraduate Chemistry Research*, 20(4), (2021), 13.
2. Computational approximations of mutated molecules of SARS COVID-2 spike proteins at S1/S2, **Jamison S, Seker SE, Myers RO, Gatling MA**, and Hahn I*, Department of Biology and Department of Chemistry & Biochemistry, Hampton University. Poster presentation at the 100th Virginia Academy of Science (VAS) meeting at Liberty University, Lynchburg, VA, May 19-20, 2022.

Faculty Name: Dr. Malik Muhammad

Dr. Malik's research interests are the synthesis of ion exchange resins for chemical separations and nonthermal plasmas for medical uses. Dr. Malik also focuses on developing new materials for chemistry education.

Keywords: organic synthesis, chemistry education, textbook development, laboratory practicals

Recent Dissemination: Journal publication(s) or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021

Student Participant(s): Zuri Williams

Peer-reviewed

S. W. Ali, M. A. Shafique, M. A. Malik, M. Saad, S. R. Amber, A. Jabeen.(2021).Adjusting Water Absorption, Stimulus-Response and Adsorption Capacity for Toxic Heavy Metal Ions of Poly(acrylamide-co-potassium methacrylate) Hydrogel by Poly(ethylene glycol) Addition. Polym. Korea, Vol. 45, No. 6, pp. 832-840 (2021), <https://doi.org/10.7317/pk.2021.45.6.832>

Books

1. Qualitative Analysis of Common Cations in Water (Malik). (2022, April 16). Hampton University, Hampton, VA. <https://chem.libretexts.org/@go/page/367675>
2. Introduction to General Chemistry (Malik). (2022, April 26). Hampton University, Hampton, VA. <https://chem.libretexts.org/@go/page/371202>

Faculty Name: Dr. Edmund Moses N. Ndip

Dr. Edmund Ndip's research focuses on the design, synthesis, and computational and laser spectroscopic characterization of organic (aromatic azo-, imine-, and vinylene-bridged heterocyclic) semiconductors for optoelectronic devices and photodynamic therapy (PDT). We are focused on the elucidation of structure-property relationships with particular attention to the relationship between molecular and electronic structure and non-linear optical properties (polarizabilities and hyperpolarizabilities). Dr. Ndip also investigates using research to enhance student STEM participation.

Student Participant(s): Kimber Carter, Miya Ross (Joined this semester)

Keywords: Organic semiconductors, Density Functional Theory (DFT), laser spectroscopy, Optoelectronics, STEM education.

Recent Dissemination: Journal publication(s) with DOI and submission(s), and/or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021.

Journal publications (* Corresponding author)

1. Ghebreyessus, K.; **Ndip, E.M**; Waddell, M.; Asojo, O.; Njoki, P. N.* Cultivating Success through Undergraduate Research Experience in a Historically Black College and University. Journal of Chemical Education. 2022, 99, 307 – 316. <https://doi.org/10.1021/acs.jchemed.1c00416>

Conference Presentations

1. "Polarizabilities and Hyperpolarizabilities: A Materials Design Tool for Molecular Electronics" Dr. Edmund. Ndip 1st Annual NOBCChE Collaborative Virtual Conference, Hampton University, Hampton, VA (May 27, 2021)

Faculty Name: Dr. Peter N. Njoki

Dr. Njoki's research focuses on synthesizing and characterizing gold, palladium, silver, and copper alloyed nanoparticles. These nanoparticles have applications in catalysis, fuel cells, drug delivery, and forensic detection. Ongoing projects include the development of nonprecious bimetallic copper-based nanomaterials for applications in reducing carbon dioxide gas to value-added organic products and chemistry education.

Future works will focus on the

- (1) applications of these nanomaterials to fuel cell-based breathalyzers, detection of latent fingerprints, and trace evidence analysis
- (2) toxicity of silver nanoparticles resulting from the vast applications in many consumers' products.

Student Participant(s): E. Wideman

Keywords: Nanomaterials, Bimetallic, Catalysis, Copper-based, Silver, Alloys, Carbon Dioxide, Chemistry Education

Recent Dissemination: Journal publication(s) with DOI and submission(s) or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021.

Journal publications (* Corresponding author)

- 1) Ghebreyessus, K.; Ndip, E.; Waddell, M.; Asojo, O.; **Njoki, P. N.*** Cultivating Success through Undergraduate Research Experience in a Historically Black College and University. *Journal of Chemical Education*. 2022, 99, 307 – 316. <https://doi.org/10.1021/acs.jchemed.1c00416>
- 2) Hughes, S. M.; Hendricks, M. P.; Mullaugh, K. M.; Anderson, M. E.; Bentley, A. K.; Clar, J. G.; Daly Jr., C. A.; Ellison, M. D.; Feng, V. Z.; Gonzalez-Pech, N. I.; Hamachi, L. S.; Heinecke, C. L.; Keene, J. D.; Maley, A. M.; Munro, A. M.; **Njoki, P. N.**; Olshansky, J. H.; Plass, K. E.; Riley, K. R.; Sonntag, M. D.; St. Angelo, S. K.; Thompson, L. B.; Tollefson, E. J.; Toote, L. E.; and Wheeler, K. E. The Primarily Undergraduate Nanomaterials Cooperative: A New Model for Supporting Collaborative Research at Small Institutions on a National Scale. *ACS Nanoscience Au*. 2021, 1, 6 – 14. <https://doi.org/10.1021/acsnanoscienceau.1c00020>

Conference Presentations (HU Students)

1. **Njoki, P. N.** and **Fowler, K.** “Microwave-Assisted Synthesis of Non-precious Bimetallic Nanoparticles,” Abstracts of Papers, American Chemical Society (ACS) Spring National Meeting & Events, San Diego, CA, March 20-24, 2022.
2. Hughes, S. M.; Hendricks, M. P.; Mullaugh, K. M.; Anderson, M. E.; Bentley, A. K.; Clar, J. G.; Daly Jr., C. A.; Ellison, M. D.; Feng, V. Z.; Gonzalez-Pech, N. I.; Hamachi, L. S.; Heinecke, C. L.; Keene, J. D.; Maley, A. M.; Munro, A. M.; **Njoki, P. N.**; Olshansky, J. H.; et al. “Introducing PUNC: The Primarily Undergraduate Nanomaterials Cooperative,” Abstracts of Papers, ACS Spring National Meeting & Events, San Diego, CA, March, 20-24, 2022.
3. **Njoki, P. N.** “Microwave-Assisted Synthesis of Copper-Based Nanoparticles for Catalysis” (Invited Talk). Virginia Clean Energy and Catalysis Club 2021 Virtual Summit - University of Virginia. August 2, 2021.

Faculty Name: Dr. Godson C. Nwokogu

Research Interest:

Organic Syntheses: Development of efficient schemes for the synthesis of natural products of medicinal importance, such as resorcinol and resveratrol analogs, and synthetic optimization of some anisotropic properties of small organic molecules for materials science applications. Of interest are also the development of new reactions and the application of the principles of green chemistry in the synthetic plans for target molecules.

Current Investigations:

1. Design and development of de-novo synthesis for long-chain alkyl substituted analogs of resorcinol and resveratrol.
2. Design and development of the de-novo synthesis of push-pull molecular species with optimized anisotropic properties for non-linear optical and two-photon device applications.

Keywords: Resorcinol, Resveratrol, non-linear optics, two-photon phenomena.

Recent Publications:

None since 2019

.

Faculty Name: Dr. Vincent de Paul Nziko

Research Interest:

Dr. Nziko's research focuses on the computational design, synthesis, and characterization of small molecules. These molecules are critical components of compounds with diverse bioactivities such as anticancer and anti-fungal. Dr. Nziko is also interested in chemical education through the development of teaching and learning techniques. The ongoing project includes:

1. Synthesis of β -carboline and spiro-oxindoles as BRCA 1 inhibitors
2. Catalyst design through ab initio computations
3. Chemical Education: SCALE-UP improving the teaching and learning of organic chemistry

Keywords: Quantum mechanics, reaction mechanism, non-covalent interaction, BRCA1, SCALE-UP.

Student Participants: Micaela Maxwell, Skyler Turner, Kamiel Beckley, Kayla Fowler

Recent Dissemination:

Peer-reviewed Publications

1. N Hanna, NN Vincent de Paul, F Ntie-Kang, JA Mbah, FAA Toze, " The use of minimal topological differences to inspire the design of novel tetrahydroisoquinoline analogs with antimalarial activity" *Heliyon* 7, **2021**, 5, e07032

Faculty Name: Dr. Michelle Waddell

Dr. Waddell's ongoing research focuses on

Student Participant (s):

Keywords: , CUREs

Recent Dissemination: Journal publication(s) with DOI and submission(s) or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021.

Peer-reviewed

- 1) Ghebreyessus, K.; Ndip, E.; Waddell, M.; Asojo, O.; **Njoki, P. N.*** Cultivating Success through Undergraduate Research Experience in a Historically Black College and University. *Journal of Chemical Education*. 2022, 99, 307 – 316. <https://doi.org/10.1021/acs.jchemed.1c00416>

Conference Proceedings

Faculty Name: Dr. Dawanna S. White

Dr. White's research focuses on developing and characterizing novel small-molecule therapeutics. Additionally, Dr. White's alternative research focuses on renovating the general chemistry labs from "cookbook" labs to course-based undergraduate research experiences (CUREs). Ongoing projects include:

- 1) Development of chalcone derivatives for the treatment of triple-negative breast cancer.
- 2) Development of organophosphorus-based prodrug inhibitors.
- 3) Design and implement CUREs in the general chemistry courses.

Student Participant (s): C. Green, A. Dawkins, A. Dameus, B. Darden, T. Postal, and T. Bailey, CHE201/202 CUREs

Keywords: organophosphorus, photoactivatable, small-molecule, structure-activity-relationship (SAR), CUREs

Recent Dissemination: Journal publication(s) with DOI and submission(s) or conference presentation(s) and submission(s) related to the ongoing current research areas since 2021.

1. Facile synthesis of photoactivatable adenosine analogs. White, D.S., Mongeluzi, D., Curry, A. M., Donu, D.; Cen. Y. RSC Adv. 2022, 12, 2219. DOI:10.1039/d1ra08794k.
2. Human Sirtuin Regulators: the "Success" Stories. Curry, A.M., White, D.S., Donu, D., Cen, Y. Front. Physiol. 2021, 12, 1853. DOI: 10.3389/fphys.2021.752117.
3. Profiling sirtuin activity using Copper-free click chemistry. Curry, A.; Cohen, I., Zheng, S., Wohlfahrt, J., White, D.S.; Donu, D., Cen, Y. Bioorg. Chem., 2021, 117, 105413. <http://doi.org/10.1016/j.bioorg.2021.105413>.
4. Small Molecule Regulators Targeting NAD⁺ Biosynthetic Enzymes. Curry, A., White, D.S., Cen, Y. Curr. Med. Chem. (BMS-CMC-2021-45, Submitted)