Samuel Branch Tyndall

Undergraduate B.S. Chemistry Major – Miami University, Oxford
Chemistry Graduate Student – 2nd Year – Northwestern University, Evanston
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Miami University graduate with a Bachelor of Science in Chemistry in 2021. Wasielewski group 2nd year student and current chemistry graduate student at Northwestern University focusing on synthesizing and understanding the photophysical properties of atomically precise covalent networks of rhylene diimides.

Education

Miami University, Oxford, OH **August 2017 -May 2021**

Bachelor of Science, Chemistry

- 3.91 GPA
- President's List – Feb. 2019, Feb. 2020, June 2020
- Dean's List – Jan. 2018, June 2018, June 2019

Northwestern University, Evanston, IL **September 2021 - Present**

2nd Year Chemistry Graduate Student

- Synthetic organic chemist
- Photophysical characterization of rhylene diimide aggregates
- Wasielewski Group member

Leadership

Miami University, Oxford, OH **January 2020 – May 2021**

Miami Chemical Society Treasurer/Board

- Manages the finances throughout final year in the group
- Executive Board Member for entire duration
- ACS and ASBMB affiliated chemistry club at Miami University

Professional Experience

Idaho National Lab, Idaho Falls, ID **June 2020 – August 2020**

Summer Intern

- SULI summer internship under the DOE at Idaho National Lab under the guidance of Dr. Brittany Hodges
- Analytical chemistry research on a diglycolamide species (TODGA) using GC-FID to understand its degradation products in different solvents
- Utilized GC-GC-MS coupled with pyrolysis to analyze corn stover biofuels that have undergone different levels of biological heating
- Created and uploaded Gaussian files to INL supercomputers for DFT analysis

Zambia Study Abroad, Zambia **June 2019 – July 2019**

Undergraduate Research Assistant

- Summer study abroad trip to Zambia under the supervision of Dr. Jonathan Levy of Miami University
- Learned about the hydrogeologic patterns seen in the geology of Zambia

- Performed dye tracing tests and water quality sampling
- Collected lead dust samples to study the migration of lead from an old mine

Undergraduate Research Groups

Liu Lab, Oxford, OH **January 2018 – May 2020**

- Miami University Chemistry Department
- Synthesized starting porphyrin for electrochemical reductions
- Prepared trifluoromethyl agents for Cu^{III} catalyzed reductive elimination and studied the reductive elimination kinetics via ^{19}F-NMR
- Prepared highly selective organic molecules for radical mechanism determination of the reductive elimination seen by Cu^{III}
- Provided spectroscopic evidence via ^{19}F and ^{1}H-NMR of difluoromethylation via Cu catalysis

Tierney Lab, Oxford, OH **January 2021 – May 2021**

- Miami University Chemistry Department
- Synthesized cobalt and iron complexes for spin-crossover characterization
- Utilized NMR and UV-Vis for qualitative comparisons
- Data analysis

Graduate School Research

Wasielewski Lab, Evanston, IL **July 2021 – September 2021**

- Northwestern University Chemistry Department
- Organic Synthesis of Perylene Diimide – Xanthene oligomers for photophysical excited state elucidation
- Transient Absorption, Time Resolved Fluorescence, 2-D Electronic Spectroscopy, etc.
- NMR and MALDI-Rapidflex utilized for characterization and purity
- Summer zero year to graduate student in 2nd year

Research Interests

- Synthesis of Organic Photovoltaics for renewable energy
- Excited State dynamics of said
- Materials chemistry
- Renewable energy development and optimization
    - CO_2 reduction research
    - Organic molecule synthesis for photovoltaic applications

Publications

Cao, Z.; Zacate, S. B.; Sun, X.; Liu, J.; Hale, E. M.; Carson, W. P.; Tyndall, S. B.; Xu, J.; Liu, X.; Liu, X.; et al. Tuning Gold Nanoparticles with Chelating Ligands for Highly Efficient Electrocatalytic CO2 Reduction. *Angewandte Chemie* **2018**, *130* (39), 12857–12861.

Paeth, M.; Tyndall, S. B.; Chen, L.-Y.; Hong, J.-C.; Carson, W. P.; Liu, X.; Sun, X.; Liu, J.; Yang, K.; Hale, E. M.; et al. Csp3–Csp3 Bond-Forming Reductive Elimination from Well-Defined Copper(III) Complexes. *Journal of the American Chemical Society* **2019**, *141* (7), 3153–3159.

Zeng, X.; Yan, W.; Zacate, S. B.; Chao, T.-H.; Sun, X.; Cao, Z.; Bradford, K. G. E.; Paeth, M.; Tyndall, S. B.; Yang, K.; et al. Copper-Catalyzed Decarboxylative Difluoromethylation. *Journal of the American Chemical Society* **2019**, *141* (29), 11398–11403.