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EDUCATION

Carnegie Mellon University, Pittsburgh, PA May 2024
Bachelor of Science in Chemistry, Additional Major in Human-Computer Interaction
Mellon College of Science Dean's List, High Honors
Relevant Coursework: Modern Organic Chemistry I/II, Inorganic Chemistry, Fundamentals of Programing & CS, Chemical Analysis, Organic Synthesis, Safety and Environmental Issues for Chemists, Bio-organic Chemistry Lab, Applied Machine Learning, Biochemistry, Modern Analytical Instrumentation, Chemistry and Sustainability, Structure and Function of Human Body, Laboratory IV: Molecular Spectroscopy and Dynamics

RESEARCH EXPERIENCE

Inorganic Chemistry Lab, Researcher; P.I. Dr. Isaac Garcia-Bosch, CMU
Copper Hydroxylation Jan 2022 - Present

- Researched the catalytic capabilities of LPMOs, specifically focusing on their role in oxidase reactions and potential involvement in C-H hydroxylation via a Fenton-like mechanism. Utilized synthetic copper complexes to investigate the interaction between Cu and O2, suggesting that LPMOs may produce H2O2 for oxidase reactivity. Currently conducting studies to enhance understanding of copper/O2 species through modification of ligand scaffold.

Polymer and Material Chemistry Lab, Researcher; P.I. Dr. Stefanie A. Sydlik, CMU
Functional graphenic materials as cell intrusive scaffolds for bone regeneration June 2023 - December 2023

- Pioneering the design and characterization of functional graphenic materials as uniquely strong, ordered, and degradable scaffolds with the ability to recruit, retain, and differentiate stem cells to enable bone regeneration

PUBLICATIONS

Sagar, K., Kim, M., Wu, T., Zhang, S., Bominaar, E. L., Siegler, M. A., Hendrich, M., & Garcia-Bosch, I. (2024). Mimicking the Reactivity of LPMOs with a Mononuclear Cu Complex. *European Journal of Inorganic Chemistry*. doi:10.1002/ejic.202300774

PROJECTS

Determining Levels of Nicotine in Cigarette and Vape Products CMU | Fall 2021

- To understand the danger that cigarettes pose, the contents were further studied using gas and high-performance liquid chromatographies

Utilization of Hachimoji Nucleobases in DNA Data Storage Proposal CMU | Fall 2022

- Proposed the efficacy of Hachimoji nucleobases as analogs in DNA sequencing and synthesis and determined the stability of Hachimoji bases in the silica gel method. Created an alternative DNA coding system to read and write information with smaller storage.

OTHER EXPERIENCE

Global Medical Brigades, *Volunteer* August 2022 - Present
Participated in a week-long medical volunteer trip to provide consultation, dental, vision, and pharmacy care in rural parts of Honduras.
Supplemental Instruction Leader, *Tutor* August 2022 - Present
Offers supplemental tutoring twice a week to 30 students for Physics II and Physics I. Create practice problems and reviews for difficult content to support students in the challenging class.
Athletics Student Intramural Official, *Referee* September 2021 - Present
Enforced rules, assessed penalties, and signaled the start and end of games for CMU's intramural sports.

TECHNICAL SKILLS

Laboratory: IR, NMR, UV-Vis, TLC, atomic absorption, distillation, column chromatography, HPLC, GC, glove box, rotary evaporation, gel electrophoresis, micro pipetting, fourier transform infrared spectroscopy, thermogravimetric analysis, freeze dryer, cell culture
Software: Python, Microsoft Office, Autodesk Inventor, C, LaTeX, Mathematica, Figma, Voiceflow, HTML, CSS, Java
Languages: Fluent in Korean & English, Intermediate in Chinese, Japanese, & Spanish