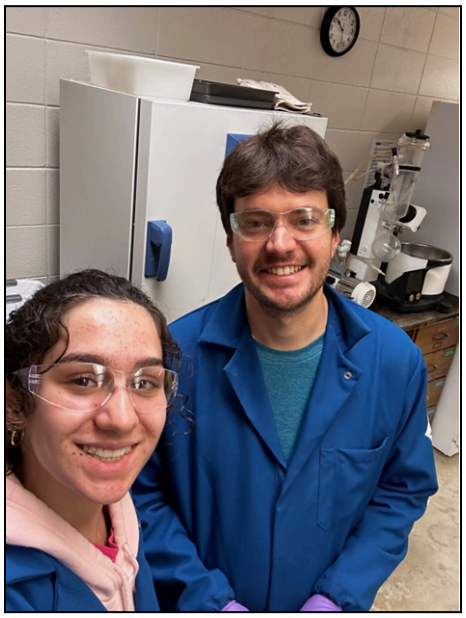
My time at the University of Missouri: The Hutchins Group Lab
By: Gauri Mehta
Editors: Kristen Yu & Anoushka Bhalla



"Have you figured out where you want to go to college yet?"

"It's okay sweetie, you don't have to know everything right now."

No, no, no, no.

I didn't know what I was doing- I knew what I didn't like and had absolutely zero clue what I wanted to do with my life. I felt I wasn't gaining realistic hands-on experience in any of my classes, and I wanted to gain exposure to more real world scenarios. After recognizing that engineering and chemistry were my two greatest passions, I wanted to gain some practical experience with chemical engineering, a synthesis of the two.

Towards January of my junior year, I found myself contacting people in the MU chemical engineering department. Initially, I received no response- until I reached out to Dr. Mary Myers, who connected me with Dr. Reginald Rogers, the head of graduate chemical engineering studies at MU. Around May, Dr. Rogers had to tend to some graduate student related issues, and told me I could no longer come in for a summer internship. I began to send emails again, only to no avail.

As desperation kicked in, I eventually ended up in contact with Dr. Prasad Calyam. Dr. Calyam put me on a project with a group of graduate and undergraduate students. This project was over drone security, funded by the NSA (National Security Agency). I spent time over the summer on the project, thinking I was going to get to work with drones and do some coding. After reading the first few papers assigned to me for background knowledge, I helped Saketh, the graduate student in charge of the project, quantify a zero trust grading scale by combining potential graphics ideas with the rest of the team. We determined an appropriate color and number scale, which was very interesting. As I continued, I learned more in-depth information about varying topics, the most informational being Bayesian networks.

I attended a lecture on Bayesian networks from Professor Ekin, which involved some various probability concepts that I was able to grasp well. I found it fascinating to consider applications of these probability concepts to security systems.

As time went on, I quickly realized I was put on a project that required upper-level undergraduate knowledge, which I did not have. I spent hours reading past research papers on zero trust systems and trying to grasp them, all with no previous coding experience. I ended up doing a lot of reformatting and summarizing for the team, as I wasn't well equipped to help with much else. As a whole, I did enjoy

learning about the scientific process and the experience helped me learn how to process difficult research concepts. However, I did find that I didn't quite enjoy cybersecurity and am more of a hands-on person.

After this experience, I wanted some interactive experience with what I had found myself more interested in: chemical engineering. Determined, I eventually reached out to Dr. Justin Walensky, the department head of chemistry after my AP Chemistry teacher, Ms. Sarah Laster, referred me to him. After meeting with him, he connected me to the lab of Dr. Kristin Hutchins. She was in charge of multiple different projects, and decided I would best fit in on an agrochemical project she was working on, which I found super interesting as it applied to environmental science topics I had learned the previous year.

The project was to develop a pesticide that wouldn't be impacted by rain and wind or contribute to increasing amounts of runoff to land surrounding farms. After completing a lab safety training course and reading a past paper, Dr. Hutchins paired me up with Delbert, a postdoc in charge of the project. Delbert was experimenting with varying compounds, doing two methods of compound analysis. He taught me an experimental method called slow evaporation, which involves crystal growth through milling the compounds together and dissolving them in a solvent, then leaving them to evaporate through a film with a few small holes on top. I used slow evaporation and milling techniques to either grow crystals or develop powders, which we then analyzed using a diffraction or powder analysis machine.

I've learned to analyze varying types of graphs and have done extensive research to keep up with the analysis and language of this research. Overall, I really enjoyed how everything fit together as part of a bigger picture, and I was able to perform hands-on research while also analyzing results.