

JUAN DAVID CAMPOLARGO

jcampo37@illinois.edu

JuanDavidCampolargo.com

1. Why they are interested in participating in URAP; and

In *Pasteur's Quadrant*, Donald Stokes examines the science dichotomy between “basic” vs. “applied” research. Basic research is the quest for fundamental research and applied research is taking ideas from basic research and commercializing them. Both are needed and both supplement each other.

It's odd but we often see people like Pasteur who contributed to the search for fundamental understanding like microbial fermentation but also found very practical uses for his discoveries such as the principles of vaccination.

I'm not a person who has always been passionate about science or research. For most of my life, I was actually on the other side of the equation: development and entrepreneurship. However, my interests in basic research have been growing and growing as I've realized how much more we need to discover in fields such as physics, biology, and chemistry. And I hope I can bring what I've learned to the research and science field.

I've been trying to understand how to approach the big questions to find discoveries. That's why I decided to get involved with Fermilab, America's particle accelerator, and Argonne, one of the largest science and engineering laboratories in the nation.

All with one goal and one intention.

Learn from the experts to close the gaps and keep contributing, carrying the torch of progress forward.

I have the same intention of participating in URAP. I'm just a kid with big dreams and bold intentions and I hope I can be extremely helpful to graduate students. And if they can and/or are willing to share what they know with me so I can keep moving the torch of progress forward in both basic and applied research, I'd be more than grateful.

Science combined with my interests brings a unique set of skills to explore unestablished tracks to get to new places. [Carlo Rovelli](#) said once, “Here, on the edge of what we know, in contact with the ocean of the unknown, shines the mystery and beauty of the world. And it's breathtaking.”

Science is my love. Science is my passion. Science takes my breath away.

The ranking of their top 3 project choices and provide a brief essay outlining why they have chosen those projects.

- **Project 8**

“Once we identify all the genes of the human genome, we’ll change biology and cure all diseases.” The Human Genome Project was completed in 2003 and while it was very impressive to sequence the nucleotides, develop databases and tools for data analysis, and the path to begin to understand the blueprint for building a person. It seems like we’ve headed a dead-on on genetics, DNA, and the human genome. It may be the right but perhaps we don’t have the technology yet or we should change directions.

I’ve noticed that Biology is increasingly becoming like Physics in lots of ways, especially asking the wrong questions more frequently. Of course, if you ask a bad question, you will get a bad answer. I believe the Human Genome Project is the foundation of a strong foundation for the future. Just like in computing, we couldn’t build a computer from scratch. We can’t cure all diseases by simply knowing and sequencing and identifying our genes.

That is why I’m **incredibly** excited about Dr. Cheng’s research which aims to understand biology using new and innovative approaches. This is something I’ve been thinking a lot about and I hope Dr. Cheng can give me the opportunity to give him all my energy, curiosity, and commitment to make great discoveries and keep biology going forward.

- **Project 11**

I come from a country where I’ve experienced political violence. In fact, that is the main reason we immigrated from Venezuela years ago. This is a topic that I’ve experienced from my eyes and a topic I could provide a lot of background and intuition as well as primary sources.

The subject is overall very interesting and this overarching theory about electoral violence could be the foundation of many more theories about the nature of violence to model and predict different types of violences, especially before elections such as Black Lives Matter protests or even the migrant caravans from 2018 before the midterm elections.

I’ve studied to great extent similar theories like Rene Girard’s scapegoating and mimetic theory which talks about how violence arouses because of our human nature of wanting to have what the other person wants. Here, wanting one party to win, and so on. This is a topic that is very important and should be given great detail attention and urgency as this theory can be used to save elections and countries as a whole as more and more regimes are finding ways to harm democratic elections around the world.

I would love to work on a project that combines meta-level thinking, game theory, statistics, and programming. That is like a dream come true to me where I can combine my passions into one

amazing project. I've written a few essays on the topics that I think might be interesting such as [Statistical Thinking](#), [You're Blind and You Have No Idea](#), and [The Case for Peaceful Protests](#).

- Project 28

This research isn't about mRNA or TRNs. This research is about making gene expression variability *Tik Tok Famous*.

Just kidding. One of my favorite concepts from statistics is dealing with variability whether trying to understand, model, or reduce it. I found it intriguing how most of the time, it was always there and I always believed that there must be something hidden that is both interesting and applicable. Such is the case it's now in bioengineering and trying to save lives by developing new drugs.

I'm well-versed with mRNA but I had not really heard about TRNs and the relationship between its structure and mRNA variability which makes me really curious to find out how to combine computational statistical skills to discover and explore new frontiers in drug development and stem cells.

I love the idea of this project but there's something deeper that makes me connected to this project how similar Dr. Mahajan's background and mine are.

We both come from a family culture that values hard work, determination, and responsibility.

We both learned that in different fields that were not necessarily tied to bioengineering, but are applied to it, we get unseen results that can only come from a very high level of tenacity.