Undergraduate Student - Research Blog: Working in a Biomedical Engineering Lab

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**Undergraduate Student - Research Blog**

**Working in a Biomedical Engineering Lab**

My name is David Heinrichs. I am a University of Arkansas student studying Biomedical Engineering. My mentor during my grant period has been Dr. Rebekah Samsonraj with the Biomedical Engineering department. In the future, I plan to attend graduate school and pursue a PhD.

In Dr. Samsonraj’s lab, I worked with Mesenchymal Stem Cells (MSCs), and I studied how they were affected when exposed to a class of drug called senolytic agents. When MSCs get older, they cease to divide and function. This is called senescence and senolytic agents can target and kill senescent cells while leaving younger cells to continue living. I wanted to find out if the younger cells left behind after senolytic treatment were still able to function normally, and I obtained promising evidence to support my objective. My research has real world significance in that, if senolytics only clear older cells, and don’t affect young cells at all, we can slow down the ageing process of stem cells so they can be more effectively used for regenerative medicine. I met my research mentor while I worked for her as a grader in a class she taught in Fall 2022. I had no research experience at that point and had no idea where to start in finding a topic. Dr. Samsonraj helped me immensely with finding a topic and submitting a research proposal. I learned a lot during my time in her lab, but the most important thing was that MSCs are living beings. Cells have their own microscopic needs, community, and even language. Thus, they need to be cared for, respected, and watched carefully if you want them to survive long-term. It was very easy to make a simple mistake, like leaving the cells in a saline solution, used to clean the cells, for 20 minutes when they should only be washed for a couple of minutes at most. That little mistake killed thousands of cells and set my progress back at least a week. All I could do was thaw out more cells and start the experiment over, learning from my mistake and using that week to catch up on other parts of my research.

Dr Samsonraj played a simple, but invaluable, role in allowing me the freedom to work at my own pace, while at the same time, meeting with me weekly to make sure I was on track and staying motivated with balancing school, life, and research at the same time. I would not have been able to get anywhere in my research without the other students I had the pleasure of working with in Dr. Samsonraj’s lab. I was trained by more senior members of the lab from cell culture to poster formatting, and I could use the training to help other students with their own research gaps. Everyone in her lab works synergistically to achieve more than any one of us could on our own. More importantly, my other lab peers genuinely like working together and are always available for help or advice.
Recently, I had the privilege to travel with some of my lab coworkers to Iowa for a conference where we all presented our research. We were able to attend sessions held by distinguished professors in academia and former students working in industry and entrepreneurial passions who came from Harvard, MIT, and other prestigious institutions. Talking with them provided amazing insight into what I want to do in the future after I graduate. We also got to talk with, and network with, other graduate and undergraduate students researching in adjacent fields. I even won third place in an undergraduate poster competition; competing against other students from around the country.

In the future, after graduation, I plan to take a break from everything and travel around the world for a while. When I get back to the US, my research experience will have inspired me to pursue a PhD in Biomedical Engineering. I hope to be able to continue working with stem cells and even expand my project into a dissertation throughout graduate school.