

Harisa Spahic

Graduation Year: First Year

College: First Year of Studies

Major(s): Biochemistry

Minors(s): Anthropology

Scholar Group Membership: Sorin Scholars

Did you received other funding for this project?: No

Could you have completed this project without CUSE funding? No

More details on CUSE funding assistance?

Project Title: Pilot investigation of the relationship between neurocognitive functioning, inflammatory biomarkers, and BRCA1/2 in breast cancer patients undergoing chemotherapy and endocrine therapy.

Project Location: Cancer Neurocognitive Translational Research Lab (CNTRL), Notre Dame, IN

ND Faculty Mentor: Dr. Jean-Pierre

Project Type: Research, Conference - Attendance, Conference - Presentation, Research Assistantship, Eagan Fellowship

Why did you undertake this project/experience? Deepen your knowledge of a topic or issue, Prepare for professional school (MD, MBA, JD), Career discernment and/or preparation, Internationalize your Notre Dame experience

Did your funded experience help you:

[Deepen your understanding of your coursework or field of study]: Very Much

[Discern your interests and post-bac goals]: Very Much

[Become confident in your ability to set and achieve your goals]: Very Much

[Gain a more nuanced view of local, national, or global communities]: Very Much

[Improve your written and verbal communications skills]:Very Much

Tell us about your experience.

Over the course of the summer, I was able to partake in numerous activities: manage a lab, conduct literature searches, prepare posters, write a scientific paper, organize patient visits, conduct patient visits, and present research at an international medical conference. My research work was focused on the interactions among inflammatory biomarkers, BRCA 1/2 status, and cognitive function in breast cancer patients that have undergone endocrine therapy or chemotherapy. This has been an emerging field over the past few decades as the number of cancer survivors increases. The occurrence of cancer and the following treatment for it has been found in previous studies to impair cognition. This cognitive impairment could negatively impact a person's quality of life as well as their daily functioning. As treatments become more effective, it is important to still care for the survivors. Working directly with the patients, I can see the effect cancer has had on their lives as they shared their experiences. It was the patient visits where we conduct the data collection that I enjoyed the most. I saw research in action and since

we recruited from a cancer care clinic, I was able to experience the medical world as well. While this was my favorite part of the summer, the patient visit organization was difficult. It required a lot of coordination with the cancer care clinic, the pharmacy, the rest of the lab, and other companies from which we acquire supplies. It exposed me to what is necessary to complete research. A researcher cannot just show up to a patient visit and expect everything be ready to go, the researcher has to be prepared. The organization part has also taught me how to communicate with others in the research network and how to get into contact with the correct person. After we collected the data, I learned from the lab's principal investigator how to understand the raw data and transform that into presentable work. This was essential to create posters for the Multinational Association of Supportive Cancer Care conference in Copenhagen, Denmark. I also learned through experience that presenting the research is much easier when you put together the poster. Presenting is an experience in and of itself that is not only a learning experience for other conference attendees but a learning experience for me as I learned to field questions on the research I was presenting. Another form of presenting work is by writing and publishing a scientific paper. I also had the experience of writing a paper with another member of the lab with guidance and help from our professor. We are still in the process of writing and revising this paper and hope to publish it soon. I have learned from this activity that writing a scientific paper is different from a standard paper in a standard university class and writing a paper on clinical research is different from the paper I wrote in my Freshman Biology Lab. I have learned that each revision makes the paper better. All the work in the lab I have done this summer has revolved about the impact cognition has in daily life and how detrimental it can be if cognition is impaired. In the breast cancer patients, we are looking at how inflammation may impact cognition. We are able to assess inflammation by our selected biomarkers. The assessment of BRCA 1/2 status is an additional facet of our research to look at the correlation between genetics and the occurrences of cognitive impairment. The assessment of the biomarkers and BRCA 1/2 required them use of blood tests that are to be done by a professional company therefore I was able to learn from the lab's principal investigator how to communicate with the blood test director in order to optimize testing. I was able to learn how the blood is tested and what goes into developing these tests. This was eye-opening because I had previously thought a simple test learned from a biology lab could be run but that was not the case. Tests are designed to use the smallest amount of blood possible to test the largest amount of data. This was not only a lesson in biology but communication

Describe the impact this project had, both on you as a student-scholar and on the people you worked with.

For me, this project has broadened my horizons. I have learned how much work much actually go into one poster or one paper. The amount of time and effort is large but the reward is high as well. Interacting with other researchers at MASCC was intellectually stimulating. I was able to learn more within the field of psychooncology as well as other fields in supportive cancer care. The attendees at this conference were primarily doctors that also conduct research which is what I hope to do down the road. I not only was able to ask them about what they do, but learn how to get to where they are. They shared the difficulties they encountered but also the highlights of the career they chose. Talking to other conference attendees, I was able to grasp just how little we actually know. There is a lot we do not know but I decided to talk an optimistic

viewpoint: potential for more research. I am excited about how the current research paves the way for future research and I cannot wait to be a part of that future. This feeling was only amplified by the numerous literature searches I performed. The interactions I had with patients provided the reason why I want to continue in research. I was able to interact with people that are affected everyday by something negative and research I am a part of can help them. It was also great to hear how excited the patients were to be a part of the research. I loved being able to answer questions they had about our research. These survivors were pleased to be helping by contributing to the scientific community as well as helping others in the future that would develop cancer. I truly enjoyed my research because of how closely we worked with the patients. Our first priority was also the patient because that is who we are doing the research for.

Describe how this experience is connected to your plans as a student or future professional.

I hope to pursue an MD/PhD in the future. This research fit perfectly with my future goals. I was able to experience what it is like to work with patients. I was able to learn how to communicate within the medical field. I was able to learn how to prepare and attend a research conference. I think this summer has been an incredible foundation into what I hope to go into. Since my plans as a student are largely preparatory for medical school and research, this summer was more of a connection from Freshman year to Sophomore year. I was able to stay intellectually challenged over the summer and experience what it is like to work exclusive within a research setting. This summer has made me comfortable with my plans for the future. Many of my peers have voiced their concerns over whether or not they would want to go into medicine and research, but after this experience, I do not have this concern.

What advice would you give other students who are planning to pursue similar projects?

My first piece of advice is to be open-minded. Do not automatically disregard an activity if it does not fit in exactly to your research question because you may find a connection that makes the activity very beneficial to your research. Second, create deadlines for yourself. Sometimes research is not extensively time sensitive therefore it may be tempting to keep putting off an activity. Do not do this because research can be unexpected in the flow of work. Things can be slow in a lab or extremely busy and it is not in anyone's best interest to amplify the activities that need to be required at a busy time. Lastly, do not be afraid to ask questions. This applies to work in a lab to conference attendance. If you do not understand something, ask the presenter, that is what they are there for. As a presenter, I loved being asked a question because I was able to elaborate more and possibly learn about areas where the research I was presenting could be better examined. As a questioner, I was able to be corrected about previous misconceptions and learn more about the topic than a poster could ever present because space is limited. In the lab, if you do not understand a task, ask for clarification because your principal investigator is there to guide you through research. If interacting with human subjects, do not be afraid to ask them clarifying questions as well. More importantly with human subjects, always remind them that it is okay to ask you questions. It is always nice to be reminded that it is okay to ask questions when someone is not sure about something.

