

Describe how you became interested in science and conducting research. In your response, please address the following: (7,000 character limit including spaces)

- Your previous research experience
- Your specific research interest for this summer
- Specific faculty you are interested in working with and why
- Your future educational and career objectives
- How you will contribute to the advancement of science

As a first-generation student and Latina in an engineering field, I see being a minority as an opportunity to be outstanding. Living in a rural community and attending a public high school with low resources made it challenging to have a competitive background when applying to universities. Due to my interest in the sciences, I enrolled in a technical college during my last two years of high school to take more advanced classes, like human anatomy and certified nursing assistant courses. During the supervised clinical experiences, I witnessed the devastating symptoms that degenerative diseases cause in patients. My experience as a CNA in geriatrics, along with a first-year odyssey class involving an introduction to pluripotent stem cells, has led me to pursue a career in regenerative medicine research.

During the summer of sophomore year, I worked as a research intern alongside members of the United States Department of Agriculture in the Agricultural Research Unit of North Carolina through the LSAMP Program. This internship was led by Dr. Suzanne Johanningsmeier and had a focus on food biochemistry. The objective of the project was to adapt assay methods for antioxidant and lipoxygenase activity of raw and blanched cucumber. I used spectrophotometry and kinetic readings to record the rate of chemical reactions, contributing to the overall analysis of volatile compounds to extend the shelf life for refrigerated pickles. In addition to exposure to a new field, I also experienced and overcame the challenges that come from the autonomy of independent research. Gaining expertise in the intricate field of food chemistry widened my skill set by challenging me to analyze and discuss the publications of other scientists to design my own protocols, and to repeat experimental procedures consistently.

As a biological engineering major at the University of Georgia interested in employing human pluripotent stem cells in regenerative medicine, I seek out opportunities to get a holistic appreciation for cellular behavior. Through my involvement in the Ronald E. McNair Scholar Program, the UGA Louis Stokes Alliance for Minority Participation (UGA-LSAMP) Program, and the Center for Undergraduate Research Opportunities (CURO) Research Assistantship, I have pursued my interest through undergraduate research at UGA.

Thanks to the guidance of my faculty mentor, Dr. Maria Navarro, I came across an opportunity to conduct research during the spring semester of sophomore year in a newly established lab that studies the manufacturing of mesenchymal stromal cells (MSCs). This opportunity led to an undergraduate research position within the Regenerative Bioscience Center at the University of Georgia under the supervision of Dr. Ross Marklein. During my first semester in the laboratory, I acquired the necessary training to adequately operate instruments, maintain sterility in the biosafety cabinet, and culture mesenchymal stromal cells (MSCs). Junior year, I began working on a project to optimize the protocol utilized in the manufacturing of MSCs from the differentiation of human induced pluripotent stem cells (iPSCs). To quantify changes in cell cultures, I routinely employ flow cytometry and automated cell counting. Through this experience, I witnessed the complexity of microscopic cellular interactions and I developed a strong appreciation for the ingenious ways that researchers alter environmental variables.

I am pursuing research as a UC Berkeley Amgen Scholar to expand my skills and explore research topics in bioengineering. In particular, I am interested in the work of Dr. David Schaffer because of his current and previous research emphasis in iPSC-derived neural cells and stem cell fate. Joining his team would enable me to learn and quantify how the environment on which cells grow affect their differentiation. Likewise,

investigations under Dr. Niren Murthy involve cardiac regeneration through cellular reprogramming for the manufacturing of cardiomyocytes. Working in his lab would challenge me to culture and understand a different cell type, along with the immersion into cell reprogramming. The laboratory led by Dr. Grace O'Connell employs the use of scaffolds for cartilage growth in vitro. Having the opportunity to engage in 3D bioprinting of scaffolds in Dr. O'Connell's lab would help me to grow as a student and researcher by introducing me to the biomechanics of tissue engineering.

The challenges I have faced as a first-generation minority have taught me to be adaptable, resourceful, and resilient in diverse settings. Research is an essential component in my journey as an undergraduate, as I hope to expand my laboratory skills and experiences to eventually earn a doctoral degree in bioengineering, focusing on using pluripotent stem cells for tissue engineering. Although I am not certain if I will seek employment in private industry, I know that I will conduct research and continue to advocate for minorities in higher education through a faculty position at a university and as a McNair Alumni. Through the current memberships I hold in organizations like the Society of Hispanic Professional Engineers, I had the chance to encourage, serve, and empower the Hispanic community within Athens, Georgia. It would be a great orgullo (pride) to continue contributing to research and eventually collaborate internationally with researchers in Latin America and beyond.

I am truly enthusiastic to be considered for the chance to become an Amgen Scholar.