

Statement of purpose

Application for Uark's program

I am a biology student from Bogotá, Colombia, studying at Los Andes University. My specific field of interest is computational biology. The reason is that, in order to understand the inner workings of molecular and cell processes, the need for these types of approaches arises as potential powerful tools, and basic statistical analysis are no longer enough. I find myself drawn towards the design, creation and application of state-of-the-art methods for analyzing the ever-growing data that is being gathered on these different areas. In consequence, for the last two years of my career, I have focused on learning about biochemistry, molecular biology, genetics, genomics, biostatistics and, most recently, bioinformatics, which, I am now certain, is the career path I want to continue upon. In that order, I have enrolled in Adriana Bernal's laboratory, at the university, in a project studying plant pathogen interaction, specifically, *Xanthomonas* bacterial infection on *Manihot* plants. My specific job has been to determine the most statistically significant bacterial effector-plant protein interactions and to discover and extract the specific enzymes and their networks involved in these pathogenic processes. I plan to also design, in the future, a prediction model for this interaction that could, potentially, be useful for other types of pathogen-plant interactions.

My main motivation for applying to this program is to continue this line of research and gain more experience and improving my skills in bioinformatics, applying computational biology and my analytical capabilities into the projects at hand. I want to continue research in microbiological processes and organisms related to agriculture and plant physiology and crops. That is the main reason the program aligns with my interests and, surely, will help me gain more knowledge on these topics. On the other hand, the data that is usually obtained in observational and experimental studies on this field is analyzed through computational methods. In that regard, I would gain a lot of experience analyzing the data, running these analyses on it and, finally, interpreting it from a biological perspective. The aforementioned objectives would greatly improve my competences for the future of my career. Last and foremost, I would have the opportunity to contribute to a scientific project in the University of Arkansas. In concordance to my knowledge and capabilities, I would surely work and put a lot of effort into helping the specific team I should be put on, by analyzing their project's data with the computational tools I already handle, for example R statistical analysis, Linux bash database handling, python data science libraries and java programming tools, or the ones I will learn during the internship. In complement to this, I would be capable of using my analytical skills

coupled with my biological knowledge, in order to provide logical explanations for the obtained results and help the laboratory to acquire new insights about their experimental data. Specifically, based on the research I have done on the projects listed in the application, I am certain the “biology of soil and seedborne fungi in field crops” research would be the one that would allow me to achieve the objectives I have mentioned the better, and the one I would be able to contribute to the most, given my current experience on similar studies, those stated before. That would be a satisfying experience for me, as a scientist, because I do believe in the collaborative network that comprises this field of knowledge, and how important it is to unite the efforts of everyone for the betterment of mankind, as a whole. In this case, I think research in phenomena related to agriculture and sustainable crops is fundamental for a viable future for our species and the rest of the biosphere, that is why contributing to it is a marvelous opportunity for me.