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During my senior year of high school, when I really began considering my college options, I began discriminating based on opportunities to be involved in active research. UK convinced me that they had ample exciting projects that I would be welcome to join even as a lower-classman. This persuaded me to join the incoming class in 2006 as a Singletary Scholar. In the second semester of my freshman year I did a study of DNA stability in the presence of nicotine under Dr. Stephen Testa for BIO 395 credit. This initial research experience led me to search for a more permanent research placement.

The Office of eUreKa! informed me of various opportunities, including the Beckman Scholarship Program, which immediately became a personal goal. After reading about the research programs of all the Beckman approved mentors, I felt naturally drawn to Dr. Christopher Schardl’s outstanding work. I asked to join his lab in the Plant Pathology department, and he generously took me in with virtually no knowledge of the subject. My brain was a sponge that first summer, and in many ways those 8 weeks transformed me into a scholar. Troubleshooting, hypothesizing, and designing experiments changed my view of science and the way I approached my education and problems. I have worked year-round in the Schardl lab ever since then, and received the Beckman Scholarship to support my independent research at the end of my sophomore year.

Research under the Beckman scholarship has advanced my education further than any other component of my experience at the University of Kentucky. Classes are an integral part of an education, but they became exponentially more enriching for me when the knowledge I was gaining became real tools for the lab, not just test material. This experience has also allowed me to build a priceless relationship with my mentor, from which I have benefitted disproportionately more. Dr. Schardl is the true reason I am a Beckman and Goldwater scholar and his confidence in me has encouraged me to apply for things I have found daunting and ultimately has led to some of my best experiences.

Under Dr. Schardl’s mentorship, I have been studying studying the Lolium pratense - Epichloë festucae symbium, which is a model system for symbioses of Epichloë and Neotyphodium species (endophytes) with C3 grasses. These endophytic relationships are of great significance in agriculture because the endophyte provides grazing grasses with increased drought tolerance but can also be toxic to grazing animals as a result of the alkaloids it produces. My work is aimed at studying genes involved in disease development versus benign plant colonization, with particular attention on seed transmissibility of the fungus. I began by studying the gene expression profiles of several secreted fungal proteins in various tissues of the plant using RT-qPCR (Real Time Quantitative Polymerase Chain Reaction). I am doing an in-symbiont localization study on the genes I found to have intriguing expression patterns. This genes, with their native promoters, have been cloned into expression vectors to generate C-terminal translational fusions with an autoflorescent protein, and introduced into E. festucae. Meadow fescue has been inoculated with my transformants to observe the expression of these genes via confocal fluorescent microscopy. I am currently visualizing vegetative parts of the grass, the goal of my Beckman project, and hope to observe the stromata and inflorescences next summer when they are produced.

With the financial support of Beckman, I have been able to present my work at the Fungal Genetics Conference in Asilomar, CA, the BioSysBio conference in Cambridge, England, the National Conference on Undergraduate Research in La Crosse, Wisconsin, the Kentucky Academy of Sciences in Lexington, Posters-at-the-Capitol in Frankfort, KY, and the Showcase of Undergraduate Scholars at UK. Currently, I am preparing to present at my final conferences as a Beckman scholar, Plant Biology in Honolulu, HI and the Beckman Symposium in Irvine, CA. Presenting at these conferences has allowed me to become a better scientific communicator and has given me the thrill of being in the middle of knowledge creation. Most importantly though, I have been able to meet successful researchers in my field, developing connections that I know I will call upon later.

I have one more year at UK but will be studying abroad in England in the fall, so my tenure at the Schardl lab will be ending in a few weeks when I leave for the Plant Biology conference. As heartbreaking as it will be to clear off my bench and say goodbye to my friends in my lab, I will be leaving as a better person, scholar and researcher, with more and better opportunities awaiting me than I had even considered when I began my stay here. I will be applying for top-ranking PhD programs in Plant Sciences this fall and feel apt candidate for this next step toward my career as a research scientist. For this, I have the Schardl lab and the Beckman Scholarship to thank.