As an educator, my philosophy is to help students understand what biologists think we know and how we reached those conclusions. To do this, I use a variety of methods informed by how humans learn. These methods include inquiry-based learning to help students think critically, engage in the material, and learn how to solve problems from first principles. My main goal is to give students learning tools that can be applied no matter what field they ultimately choose.

My teaching experiences include designing and teaching a Bioinformatics course at Duke University as the instructor of record. I am excited at the possibility to extend that course, specifically into the genomics field. With the course Genomics and Bioinformatics, I see an opportunity to combine original genomics research and programming into inquiry-based lectures and labs. In this course we will design and answer original research projects while learning the flexible and widely useful programming languages R and Python. The genomics data used by the students in the course could come from many sources, including: questions from my own research program, collaborations with others in the Biology department, scientists from other institutions, or public databases.

In any course I teach, I aim to provide a learner-centered classroom. In my previous Bioinformatics course, I presented examples from societal problems and current literature, requiring students to apply their knowledge. I had students read a paper about the decline of North American bumblebees (Cameron et al. PNAS 2011) and download the data from the Dryad data repository. We discussed the paper and the data, and the students reorganized the data with the programming language Python. They recreated the figures and tables in the paper in the statistical package R. This allowed students to better understand the basis of the conclusions in the paper and to decide for themselves what the data really say. They also analyzed the data in new ways the authors did not present. I was pleasantly surprised by the creativity of their new analyses. Assignments like this give students the opportunity to understand what they read on a deeper level and engage in the material as real scientists, all while learning practical bioinformatics programming.

Biology is ideal for hands-on and inquiry-based learning. Quantitative genetics, for example, can be a difficult subject but is important for determining the genetic basis of adaptive traits and human disease. As a graduate student at Duke, I designed a quantitative genetics lab for the new Evolutionary Genetics course: "The quantitative genetics of trichome production in *Brassica rapa*." In the lab, students learn about the difference between discrete and quantitative traits, heritability and response to selection and more by crossing *B. rapa* plants. By collecting and analyzing data, students gain an understanding of how traits are inherited. By the end of the course, the students could answer difficult questions about quantitative traits, in part, because they were able to observe the evolution of those traits.

I am continually looking for opportunities to improve my skills. I take mid-semester teaching evaluation surveys to give students the opportunity to provide me anonymous feedback when I can still effect change. At Duke University I earned a Certificate in College Teaching, a program designed to improve future faculty teaching skills by providing courses on subject-specific best practices, reflective teaching and peer observation. I also applied for and received the Bass Fellowship for designing an undergraduate course in Bioinformatics. I developed curriculum on quantitative genetics for the Evolutionary Genetics course and have served as a teaching assistant for five semesters at Duke University and two semesters at the University of Minnesota.

Mentoring undergraduates is one of the most rewarding and enjoyable parts of science. At Duke University, I mentored five undergraduates, all of whom conducted independent research projects. I worked closely with Ibtehaj Naqvi to optimize protein expression and sequence key taxa that resulted in a publication (Prasad et al. *Science* 2012). Chris Strock helped me design and implement a massive greenhouse experiment that is under review at *New Phytologist*. Students Allison Khoo and Rue Jiang completed honors theses and presented their work at their honors poster sessions. With my encouragement, my mentees have also applied for internal grants at Duke and earned funding for their projects. I was fortunate as an undergraduate to have excellent research opportunities and I am committed to providing the same opportunities to young scientists.

As faculty, I will help students to find an independent project that builds from my own research systems in either plant secondary metabolism or the vertebrate corticosteroid pathway. I will help students find their own research objectives by learning about their interests and goals and guiding them to open questions. Since my research is focused on biochemical pathway evolution, nearly any system with functional diversity and an assay to test those functions is available for inquiry. Particularly ambitious students with an interest in either biochemistry or evolutionary genetics can help develop a new system of their choice with my guidance. If they propose their own system, the process will begin with phylogenetic analysis of the proteins of interest, and development of the functional or phenotyping assays. In this way, my lab will be of interest to students studying biochemistry, genetics or evolution.

I decided to pursue a career in academia so that I could use my interest in biology and teaching to train the future generations of scientists. Through the courses I have taught, I found that I have an interest in the way we learn, and I want to use this knowledge to inform my teaching. Science offers a unique way to teach the process of logical inquiry that is an important skill for any responsible member of society, not just scientists.