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Teaching Statement

Sometimes, people grow up without noticing the distinction between biology and stamp collecting. They think that biology is about memorizing binomial nomenclature, anatomy, or amino acids, and that these words are to be memorized for a test and then quickly forgotten. But this view could not be further from the truth. Biology is a tangled web of interconnected concepts, theories and hypotheses about how living things work. Evolution is the thread that ties that web together, and my primary goal in teaching, mentoring and outreach is to help both students and the general public see this.

My diverse background ensures that I am qualified to teach a variety of courses. My research exists at the intersection of mathematics, statistics, computer science, and biology. Hence, I would be able to teach introductory biology courses as well as more advanced courses in statistics, computational biology, population genetics, or evolution. I see laboratory exercises as an essential part of any curriculum, because they promote active learning. In particular, computational laboratory exercises should force the students to come up with their own solution to problems, to ensure that they truly understand the underlying concepts. This will also assist them in their futures, where computational skills are becoming more important in both industry and academia.

As a graduate student, I was able to teach at both the undergraduate and graduate levels. During my teaching, I stressed the importance of seeing connections between seemingly disparate areas of biology to my students. To do this, I crafted assignments that would engage the students, and force them to utilize all of the information they learned during the course. For instance, while teaching undergraduate human genetics, we created an assignment that required students to read a paper about disease gene mapping using natural variation. This required them to bring together their knowledge of both classical and molecular genetics and interpret it within a population genetics framework. I also co-taught a two-week-long bootcamp to introduce biologists to computational techniques; we met five days a week, for eight hours a day. This required me to adapt and develop different teaching strategies than those I would use in a normal classroom setting.

In addition to teaching at the university level, I also went into local schools to ensure that students from diverse socioeconomic backgrounds could have the opportunity to be as excited about evolution as I am. I believe it is important to show children from a young age that scientists are people, too, so I worked with Bay Area Scientists In Schools to teach community ecology and predator-prey relationships to middle school students by using interactive activities. In addition, with other graduate students and postdocs, we developed a series of lectures and activities to teach high school students about evolution, phylogeny and natural selection. During my postdoctoral fellowship, I am continuing my outreach by working with HiveBio to develop courses for the general public on inferring phylogenies from genetic data.

Classroom learning is essential for turning students into productive scientists, but receiving mentoring from more senior individuals is critical, as well. I was fortunate to mentor an extremely bright undergraduate (Stephannie Shih) during my graduate work, and our collaboration resulted in a publication. She is now pursuing a Ph.D. in epidemiology at Brown University. Additionally, I worked with several younger graduate students in a mentorship role. Several of these collaborations resulted in publications in which no faculty members were involved, and I took on the duties of providing guidance and direction for the research.