TEACHING STATEMENT – PATRICK A. GREEN

I built my philosophy as an educator through experiences across educational levels and audiences. I have taught undergraduate and graduate students, developed teacher training initiatives, taught 5th and 6th grade outdoor science, and written curricula for summer learning programs at a natural history museum. These diverse experiences have built my drive to show all students that taking classes from animal physiology, to behavioral ecology, to coding in R, develops a way of thinking that is applicable to their daily lives. I have instilled and will continue to instill this knowledge through classroom teaching, training and outreach, and mentorship.

CLASSROOM TEACHING

While I have a diversity of teaching experiences, my work in the course Principles of Animal Physiology (BIO 329L) most strongly influenced my approach to teaching. This course, in which I was a Teaching Assistant and, in a later semester, Laboratory Coordinator, taught 30-60 students physiological principles using lectures and weekly, 3-hr laboratory sessions. In labs, we helped students develop their own experimental tests of concepts including muscle physiology and oxygen metabolism, which they turned into research papers. From a pedagogical standpoint, this course developed my ability to use active-learning techniques during lectures, such as daily quizzes that gave students multiple chances to succeed and me as a teacher multiple chances to identify challenging concepts. This course also showed me the importance of ensuring basic understanding of the scientific method in a student-driven lab: I found that spending an hour re-teaching the concepts of hypotheses and predictions saved students weeks of confusion in the long-term. Finally, because students in this course were building toward careers from evolutionary biology to medical school, teaching it helped me build my passion for reaching students with a diverse set of interests. Through coursework in the Duke Certificate for College Teaching program, I have developed a syllabus for a similar lab-based, writing-intensive Animal Physiology course that I would be excited to teach as an upper-level undergraduate course.

In addition to holding 7 Teaching Assistantships, 1 Instructor-level position, and presenting 8 guest lectures, I have developed further skills through non-traditional teaching experiences. For example, I was awarded three Duke Data Expeditions Teaching Awards alongside a fellow PhD student. Using real data from this student's dissertation, we taught guest lectures training undergraduates to organize, analyze, and plot data in R software ([more about this course, including R code and data](#)). This, combined with my more recent experience learning further coding concepts in R, leaves me ready to teach students how to code and analyze biological data, including data they or I might generate.

I have also taught my peers. For example, I co-designed and co-taught a course that helped my fellow graduate students recognize transferable skills useful in careers within and outside of academia ([BIO 790: Biology Boot Camp](#); funded by a Duke Professional Development Grant). This course used role-playing, panel discussions, and other techniques to teach topics including time management, careers outside academia, how to give elevator pitches to diverse audiences (from other scientists to one's family), and implicit bias. In a post-course survey, students reported increased confidence in topics ranging from identifying transferable skills (17/19 students felt more confident, 2/19 equally confident compared to pre-course), to presenting research to a lay audience (15/19 more confident, 4/19 equally confident), to preparing job materials (15/19 more confident, 4/19 equally confident; survey data available upon request).

TEACHER TRAINING AND OUTREACH

Being an educator goes beyond teaching—it requires building and facilitating relationships among fellow educators and across educational levels. To this end, I have participated in several training and outreach initiatives. I moved to improve training and recognition for Duke Biology graduate students by

becoming the graduate student representative on the Duke Biology Teaching Assistant Committee. Here, I helped implement a yearly Teaching Assistant Award, facilitated Teaching Orientations and Debriefing Sessions, and developed a compendium of course information to help students decide which course to TA for.

I have also built relationships outside of the graduate school community. From 2013 until 2018, I was part of the Leadership Team of SciREN—the Scientific Research and Education Network—a 501c3 nonprofit dedicated to improving science literacy. As the Researcher Liaison for SciREN Triangle (comprising the Triangle region of North Carolina), I recruited ~75 scientists each year to transform their research into K-12 lesson plans, which were distributed at events and uploaded to a free online portal (www.sciren.org). From 2013 through 2018, supported by nearly $5,000 from local donors as well as a >$13,000 Duke grant, SciREN lesson plans reached an estimated 25,000 K-12 students in North Carolina and beyond.

INDIVIDUAL AND GROUP MENTORING

I use individual and group mentoring efforts to develop the next generation of scientists. I have mentored two Master's students, 13 undergraduates, a high school student, and a high school teacher. Eight of these individuals are from groups underrepresented in STEM. I have published with three of these mentees, and at least three of these them have gone on to begin PhD programs of their own. Some of these relationships have been one-on-one, such as my mentorship of an undergraduate's Summer Research Fellowship project. Other relationships have been in a larger context; for example, as a postdoc at Duke University I recruited, organized, and supported the efforts of five undergraduates working on similar projects in the lab at the same time.

In addition to working as a mentor for younger scientists, I also work with my peers. For example, I initiated and led a peer-based review group in which graduate students reviewed each other's manuscripts, presentations, and grant proposals. Feedback from this group led to accepted publications and grant proposals (both large grants, like NSF GRFPs, and small grants, like Sigma Xi and Rosemary Grant awards), as well as successful conference presentations. This peer-based style of group review may have been particularly useful for students from underrepresented groups, who often face challenges discussing their work with faculty or others in positions of power. In recognition of my contributions to mentorship at Duke, I was one of two graduate students awarded the 2018 Duke Dean's Award for Excellence in Mentorship (award description).

PROSPECTIVE COURSES AND CONCLUSION

Through my diverse experiences, I am able to teach introductory through graduate-level courses using laboratory, field, and active learning-based classroom techniques. I am able to teach material spanning Behavioral Ecology, Animal Physiology, Coding (in R), Professional Development, and other concepts. I would be particularly interested in teaching courses that intersect these subjects, for example that incorporate data collection from behavioral observations in the field or lab with data analysis using R. My history of working beyond the classroom to facilitate teacher development and to mentor others shows I am well-suited to help students of all levels and backgrounds. Overall, my skillset and experience leaves me ready to develop the next generation of scientists as well as an educated public that can think critically about the world around them.