TEACHING INTERESTS

My teaching interests largely reflect my research aim of bringing together evolution, population genetics, biostatistics, and genomics. In my graduate education these topics were spread out over multiple courses each designed to teach only one aspect of a field that I believe is better understood by a synoptic view of theory, methods, and ideas. As an educator my goal is to provide a unique perspective on how knowledge from these diverse fields can be used to inform biological reasoning and to create new lines of scientific inquiry. Below I provide brief descriptions of some undergraduate and graduate courses that I would like teach.

Introduction to Genome Sciences

This course would provide an overview of both the computational and laboratory tools necessary for modern biological research. Topics to be covered include: genome sequencing and assembly methods, DNA databases and associated search algorithms, assays of transcription level (microarrays, ESTs, SAGE, Q-PCR), and various methods in proteomics. Students will be given several small projects to fulfill during the course that are relevant to each of the topics covered (such as aligning sequences, searching GenBank, and simple clustering of transcriptional profiles). This class is intended as an introduction for biology majors, but could easily be adapted to graduate students or more advanced undergraduates by adding basic instruction and application of Perl and object-oriented programming.

The Human Genome

An undergraduate course intended for non-majors, the aim would be to relate important advances in biology to an audience interested in human history and evolution. Mixing readings from popular science and introductory biology texts, this course would cover three main areas: basic biology and genetics, the evolution of humans and the other primates, and genetic variation among humans. Additional topics covered under these major headings will include nature vs. nurture, antibiotics and the evolution of human pathogens, and evolutionary psychology. This course will be an introduction to critical thought about the biological claims that non-scientists are presented with every day.

Population and Comparative Genomics

A graduate level course focusing on the quantitative analysis of genomic data both within and between species. This course will provide sufficient background to students so that they may conduct research in this area. A thorough overview of both data and models in molecular population genetics and molecular evolution will be brought together with the

statistical and computational tools necessary for the analysis of whole genomes. The course will cover the evolution of both coding and *cis*-regulatory DNA, the evolution of gene families, and the application of quantitative genetics analyses to data on transcriptional activity. Through a mix of lectures, readings of current literature, and computer workshops, the students will be introduced to a variety of computational and statistical techniques and will be asked to conduct an original analysis on the topic of their choosing.

Additional course topics

In addition to the courses described above, I am interested in teaching courses on population genetics, molecular evolution, evolution of development, the modern synthesis, and biostatistics.