



Evan Smith, 2017

Dragon Genes Take Flight . . . to Hawaii

Although dragons (such as the fire-breathing creature depicted by Honors student Evan Smith) are exciting, they are dangerous and expensive to house in a laboratory setting. Therefore, to investigate the genetic and molecular mechanisms underlying various (dragon) phenotypes, Biochem 390G students breed research-tractable cousins of dragons, called drakes, in the interactive, computer-based gaming environment of Geniverse. Developed by the non-profit [Concord Consortium](#), Geniverse allows students to conduct drake breeding experiments, analyze the data, and propose hypotheses to explain the results. A Gene-to-Protein Genie illustrates the transcription of DNA and translation of RNA for relevant genes. Overall, the course spans fundamental Mendelian genetics, epigenetics, genetic engineering, and genome editing. Additionally, students in an Honors section of Biochem 390 utilize bioinformatics tools to build new drake genes, mutant alleles, and phenotypes based on investigations of the scientific literature. Honors students have, for example, created drakes whose genotypes give rise to deafness and dwarfism, cancer and cold tolerance, polydactyly, and the ability to spit spider silk. Emerita Professor Molly Fitzgerald-Hayes and Ludmila Tyler built the course, with input from Dr. Frieda Reichsman of The Concord Consortium. Biochem 390G(HH) is taught by Dr. Tyler and was offered for the second time this spring. This summer, Dr. Tyler presented a poster on students' work and learning gains at the American Society of Plant Biologists' annual conference (Plant Biology 2017) in Honolulu, Hawaii.