

Using *C. elegans* to Teach Transmission Genetics in a Large Introductory Biology Lab

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Transmission genetics is a core topic in most introductory biology courses and yet many students rarely think about genetics beyond Mendel's classical experiments with peas. In our introductory biology laboratory course, we expand students' notions of transmission genetics by using *C. elegans* as the model system to determine whether an "unknown" Unc mutation is linked or unlinked to a known Dpy marker. In a course that serves not only biology majors but also neuroscience majors, pre-meds, and non-majors, the students see direct relevance in studying mutations with direct links to human neurological conditions. Our genetics module is a four-week session that culminates in a writing workshop designed to aid students in writing their first formal lab report. Week 1 serves as an introduction to best practices in using a dissecting scope, sexing the worms, distinguishing single mutant morphological phenotypes, and setting up a P₀ cross with 1 mm long males and hermaphrodites. In week 2, the students score their P₀ cross, set up their F₁ crosses, and practice distinguishing wild type, single mutants and double mutant hermaphrodites. During week 3, the students score their F₂ progeny, analyze their data, and test their data set against a null hypothesis that the two genes are unlinked using Chi-square. The format of the lab report is introduced and discussed in class. In week 4, student teams meet with their lab instructor to go over a rough draft of their lab report. This one-on-two time dedicated to improving the content of the report allows for correction of major misconceptions and errors in formatting the report. Week 4 is also dedicated to a self-guided online Wormbase bioinformatics exercise which is designed to help students formulate their ideas for the future directions sections of their lab report. This poster presents student learning objectives and assessment, and the logistics of preparing materials that enable over 400 freshmen to carry out a series of genetic crosses during a four week lab module under the guidance of master level graduate teaching assistants and one full-time lab coordinator.

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