



ASSOCIATION FOR BIOLOGY LABORATORY EDUCATION

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Chromatophores and Color Change in Killifish (*Fundulus heteroclitus*)

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This exercise was designed to have students 1) observe a physiological color change in whole organisms, and 2) correlate the color change (*in vivo*) with the responses occurring at the cellular level (*in vitro*), especially in dermal melanophores. The color change process is relatively fast (30-45 min) in killifish subjected to a black background, and the time course can be quantified using a simple color index of 1 - 5. Dermal melanophores are very large and the degree of melanin dispersion can be easily determined under the dissecting microscope (Hogben and Slome, 1931). This pre-designed experiment was used as a pilot study prior to a subsequent series of student-designed experiments with an emphasis on mechanisms of physiological color change in animals.

Hogben, L., and D. Slome. 1931. The pigmentary effector system. VI. The dual character of endocrine co-ordination in amphibian colour change. *Proceedings of the Royal Society of London. Series B*, 108:10-53.

Concept Mapping as a Learning Strategy in Introductory Biology Laboratories

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This workshop presents new data regarding the effectiveness of student-designed concept maps as a learning tool in introductory biology laboratories. Our introductory biology lab courses have traditionally used short quizzes at the beginning of each lab period as an incentive to encourage students to read the exercise before lab. Because students have not performed the lab at the time they take the quiz, the quizzes usually are composed of objective questions that evaluate a student's recall of the general purpose of the lab exercise and a few terms defined in the lab manual. To help students develop a stronger conceptual framework for understanding the lab exercise, we have begun to incorporate concept maps into our introductory laboratories. To assess the effectiveness of concept maps in comparison to quizzes, instructors teaching two different laboratory sections have conducted one section in the traditional manner of administering quizzes at the beginning of each lab, and a second section of the same course using concept mapping. Students were instructed in the design of concept maps, and they developed their own maps for each lab exercise. I will present comparisons of student performance in traditional lab sections and sections using concept mapping. Workshop participants will also have an opportunity to work in teams to develop a concept map for a biology lab exercise.

Integration of Computer Lab and Wet Lab Without Loss of Functionality: Computer-augmented wet labs

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Biology labs are typically not conducive to computer use. The hazards of a wet lab preclude computers being on the bench top, so students either use laptops or go to a PC lab in another room. Laptops are prone to drops and spills, and are expensive and difficult to repair. Sending them to another lab isolates the lab experience and prevents many applications of the computer in the lab. However, computer use is important in preparing students for the future. We have integrated a full computer lab into our introductory teaching labs. Every pair of students has their own PC at the