Program/Abstract # 74

Animations as supplemental resources for biology course
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Computer animations are becoming prevalent as textbook inclusions, websites and instructional CDs. How should these be incorporated into courses? A series of animated lessons have been composed as visual aids for the Developmental Genetics course at WVSOM. To evaluate these animations as supplemental resources, students were provided with the animations during the course, and asked to fill out a questionnaire when the course was over. Thirty one students from the classes of 2009 and 2010 participated in the study. The proportion of subjects who used the animations was 31%, while 16% studied the majority of the files, and 57% thought the animations saved study time. Interestingly, 12 times more subjects devoted the majority of their study time to handouts. They also rated the handouts higher than the animations, although the difference was not significant. Experience with animations, handouts and lectures increased the number of subjects preferring each, while no one was left preferring the textbook. Before and after the conducting the study, the greatest preference was for all four media, followed by handouts, then lectures, then animations. To directly compare animations to handouts, candidates from the class of 2012 are being mailed a representative animation and handout. The preliminary results suggest that the animation is as effective as the handout. These results suggest that animations are a valuable supplemental resource for many students, but not for everyone, and caution should be exercised with efforts to replace traditional teaching methods with digital animations.

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Program/Abstract # 76

Engaging undergraduates in the scholarship of discovery using a Drosophila deficiency screen
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Guided undergraduate research experiences teach the process and content of science in an integrated way. They have the added incentive of generating novel insights into biological phenomena allowing students to experience the joys inherent in the scholarship of discovery. Students in an upper level undergraduate research course used Drosophila melanogaster to conduct a deficiency screen with the goal of identifying novel gene regions influencing female sperm storage, a developmental process. Female sperm storage consists of sperm retention in specialized locations within the female reproductive tract and is an essential reproductive step for many animals. In one semester, students screened two deficiency lines for phenotypes consistent with a failure to store sperm normally. They used FlyBase to identify the genes uncovered by their deficiency and identified human homologues of these genes. Finally, they wrote papers in which they proposed models describing the actions of candidate genes on the process of sperm storage. This work allowed them to explore topics in experimental design, genetics, development, and bioinformatics.

Program/Abstract # 75

A seminar that introduces freshmen to biology research and researchers
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Research universities have numerous scientific resources at their disposal, but they often struggle to engage potential undergraduate biology majors. To remedy this problem, we have developed a freshman seminar to provide early exposure to biology, familiarize young students with cutting-edge research and researchers, and encourage undergraduates to participate in research projects. The course, Freshman Seminar in Local Biology, is taught in sections of 5-8 students to provide an intimate, personal atmosphere, more reflective of the social environment in which scientific research is performed than the standard large introductory science classes. Each section is led by a graduate student or postdoctoral instructor. We have developed an extensive instructor manual and provide in-depth training for the section leaders as they develop lesson plans and student assessments. Each section explores a different research paper published by a featured local laboratory at Rice or in the adjacent Texas Medical Center (TMC) complex. Tours of the lab where the section leader works, the lab that published the section’s featured article, and several labs in an off-campus TMC department are integrated into the course. The tours allow hands-on observation as well as interaction with the researchers—professors, graduate students, and undergraduates—who conducted the research that was studied in the classroom. In the first year of teaching the course, evaluations from students and section leaders have been overwhelmingly positive. More details can be found on the course website: www.bioc.rice.edu/bios115. (This work is supported by an HHMI Professor grant to BB.)

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