A Start-up Manual for Undergraduate Research Students in Microbiology: Active Learlo OHolland, Michigan USA

Abstract

This start-up manual accomplishes two main goals: time effectiveness and education through active learning. By having a research manual, the time professors spend on training students decreases. Through active learning, the retention rate of students increases. The manual is used before research activities begin and serves as an immediate reference throughout students' time in lab.

Activity

Invitation for User Feedback. If you have used the activity and would like to provide feedback, please send an e-mail to MicrobeLibrary@asmusa.org. Feedback can include ideas which complement the activity and new approaches for E x

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limited in the number of students they can take and train because the training process, and the repetition, are very time consuming.

There are many students who want to be involved in research activities. How does the professor accommodate as many students as possible? Most of the techniques used in the research projects are not incorporated in the lab activities associated with a class. How does the professor teach all the basic yet necessary concepts and techniques, which are new to students, in a short period of time without overwhelming students? Most of the undergraduate students join research laboratories in their junior year. How does the professor spend less time in training and more time in obtaining meaningful data? The solution to these challenges will lead to successful student training as well as career satisfaction for professors.

The proposed solution: A start-up manual for undergraduate research students.

The key is to spend less but more effective time with each student. The traditional passive learning approach demands a lot of time from a research supervisor and retention rate of students is low. An active learning approach will re-direct the responsibility of learning to students so the retention rate is higher, which decreases the necessity of repetitive training and explaining.

In response to the frustrations expressed by research students and supervising professors, we developed a start-up manual for incoming research students. Our manual presents most of the concepts and techniques that a student with limited microbiology experience must learn to start independent research safely and effectively. Since research requires active investigation, a self-motivated, hands-on learning approach will stimulate the student t(n)50.7.7 19.3y80.7(t t)-7.7((n)50.7.7 1883(o)

• Learn dish-washing and waste disposal techniques.

Exercise:

- Interpret the labels given below (attach a marked HMIS label in the manual).
 Locate the nearest safety shower and mark it on the building map provided below.
 Locate the "sharp box" and a biohazard bag in the lab and record their locations.
 Find (insert laboratory supervisor's name) home phone number in case of emergency and record it here.

2. Preparation of Solutions

Objectives: