1-1-2016

"My Lab Participates in the Natural Products Research Group at UAH Searching for Potential New Drugs from Plants"

Debra M. Moriarity
University of Alabama in Huntsville

Faculty Member:
Debra M. Moriarity, Dept. of Biological Sciences
College of Science
moriard@uah.edu
256-824-6045
SST 369A

Project Summary

My lab participates in the Natural Products Research Group at UAH searching for potential new drugs from plants. For the past 20 years we have been screening plant extracts and fractions form purification procedures for anti-cancer activity. Many undergraduate students have participated in this research throughout that time. Human tumor cell lines are screened using a cytotoxicity assay in the presence and absence of the test extracts. Killing of >90% is considered positive. Activity-guided fractionation is then used to isolate and identify the active compound(s). RCEU students would learn to culture mammalian tumor cell lines and how to perform the cytotoxicity screening on various plant extracts.

Student prerequisites

Students should have taken at least BYS 119 & 120, and CH 121 & 123. BYS 300 and 321 are beneficial but not required.

Student Duties

The student will first learn to culture the human cell lines, specifically the MCF-7 breast cancer cell line. This will involve learning how to make the growth media, use sterile technique, use an inverted microscope to view the cells and how to work in a bio safety hood. The student will work closely with Dr. Moriarity to learn all these techniques and will be able to change culture media and passage the cells on their own by the end of the project. The student will also learn how to design a cytotoxicity assay, perform the assay and obtain data using a 96 well plate reader. They will then learn how to calculate the % of cells killed by each test extract and interpret the results. They will be responsible for washing some of the glassware they use and preparing it to be autoclave. The ability to do mammalian cell culture is a very marketable skill? In fact today I was sent an ad for a lab technician from a company at the HudsonAlpha Institute that specifically indicated a need to be able to do mammalian cell culture. In addition, learning to make the solutions needed for cell growth and for the assays will provide valuable experience for further lab classes and for employment. Using the cell culture microscope and plate reader will also be experience that most students would not get. Many students who have worked in my lab on this project in the past have gone on to graduate school, medical school or to employment with biotech companies.

Mentor Supervision and Interaction

The student will be taught the techniques for cell culture directly by Dr. Moriarity. She will work with the student each day as they learn the procedures. The student will also be assigned chapters to read in a cell culture techniques book and will go over what they have read each week with Dr. Moriarity. The student will also read research articles concerning previous work form the lab and by others. Either Dr. Moriarity or a graduate student will teach the student how to properly wash glassware and prepare it to be autoclaved. The student will meet with Dr. Moriarity every day, with some days taking longer than others depending on what is being done

in the lab that day. Most of those meetings will be in her lab, SST 367; however, to discuss some of the readings the Biology Conference room or her office will be used. The student will also attend lab meetings which are generally held bi-weekly. The student will produce a report of the results of their experiments at the end of the summer that will be evaluated by Dr. Moriarity. Typically it takes students one week of observing the culture techniques, and two weeks doing them with close supervision before they are able to maintain cultures on their own. Similarly, they will be shown how to set up the 96 well cytotoxicity assay once or twice and then can perform it on their own.