DIVISION OF PHARMACEUTICAL SCIENCES
JAMES L. WINKLE COLLEGE OF PHARMACY

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2017

PROJECT TITLE: Understanding Surfactant Mildness

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Project Description

Understanding Surfactant Mildness

Supervisor: Prof. Gerald Kasting
Area of Research: Surface and colloid science

Consumers contact cleansing products (soaps, detergents, shampoos, etc.) many times a day. The surface-active agents, or surfactants, present in these products are vital for the cleansing action, yet they can also be harsh on skin and hair. Considerable effort is invested in the consumer and personal care industry to develop cleansing formulations that are both effective and well tolerated under repeat exposure conditions.

This project will examine laboratory methods to predict surfactant mildness on skin. The focus will be on compositions intended for use in rinse-off personal care products, e.g. shampoos and shower gels. The student investigator will work with trained personnel in this area to develop a new method to complement the battery of existing ones, which presently include surfactant deposition on skin, critical micelle concentration, micelle size, zeta potential, zein dissolution, stearic acid dissolution, and sub-micellar aggregate characterization. We seek more information on micellization kinetics and surfactant mobility. In particular, the project will explore the use of simple foam volume and stability measurements to improve the prediction of surfactant deposition on skin and the associated clinical effects.

The student investigator will learn basic principles of surfactant formulation and performance. In addition to the foam volume measurements, she will make instrumental measurements of surface tension, micelle size
distribution and zeta potential and (optionally) surfactant deposition using a radiochemical technique. As another option, the mathematically inclined student may perform a multivariate statistical analysis of the assembled data using methods we have developed in our laboratory. The student will leave with a sense for the teamwork and diverse set of scientific methods required to make advances in the consumer products area.