

Department of Biological Sciences
MCMICKEN COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2006

The Department of Biological Sciences is pleased to offer the following research project for the summer of 2006. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and if possible, develop a timetable for the twelve-week research period.

PNEUMOCYSTIS LIPIDS

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A WISE summer project in the Kaneshiro Laboratory would be to participate in a project on *Pneumocystis* lipids (sterols). *Pneumocystis* is a protist that can cause a type of pneumonia in immunodeficient mammalian hosts and can transiently colonize the lungs of normal individuals. One question to be addressed is to determine whether the pathogen-specific sterols remain detectable in the lung after the organisms are cleared thereby providing evidence that the infection had been present in that individual. The student will learn lipid analytical biochemistry including extraction, purification, and column, thin-layer, and gas-liquid chromatographic techniques.

Another potential project is to study predation in the bacterium *Bacteriovorax stolpii*, which attacks and parasitizes other larger bacteria. *Bacteriovorax stolpii* is an unusual bacterium because it contains sphingolipids, which we suspect might play a role in this behavior. It is not known whether other bacterial genera that exhibit predation also contain sphingolipids. The student will analyze the lipids of the genus *Bdellovibrio* for sphingolipids and if present, determine whether the sphingolipids can be prevented from being synthesized, and whether the bacterium is still able to grow under these conditions. The student will learn culturing methods with and without inhibitors, lipid analytical methods, a variety of microscopic techniques, and standardizing assays to quantify the predatory and parasitic behaviors.