

Department of Physics

McMicken College of Arts and Sciences

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2007

The Department of Physics is pleased to offer the following research project for the summer of 2007. 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.

**EFFECTS OF MICROWAVE RADIATION ON CELL-CELL
COMMUNICATIONS**

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Project Description

The second area focuses on interactions and communications between biological objects (cells), and is collaboration with the Department of Biomedical Engineering at UC. We work with endothelial cells which, under certain conditions, form capillary networks in culture. This process is guided by complex cell-cell communications. Currently, we are investigating how the formation of the capillaries (angiogenesis) is affected by exposure to microwave-frequency signals comparable to those extensively used in commercial and consumer electronics (cell phones). This is important for two reasons. First, recent studies find that the effect of alternating fields of certain frequencies on living tissue and cells is not limited to that of the small heating that they tend to produce, and therefore careful studies of frequency-dependent phenomena are needed to assess potential harm of low-power high-frequency radiation. Second, precision microwave transport holds promise for developing new non-contacting transport techniques for studying cell-cell communications in a group of only a few cells, as opposed to hundreds as in the current experiments. This would make the experiments much more direct than what is currently possible.