

**Department of Mechanical Engineering
COLLEGE OF ENGINEERING**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 3, 2008

The Department of Mechanical Engineering is pleased to offer the following research project for the summer of 2008. 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.

**PROJECT TITLE: INFLUENCE OF BLOOD FLOW ON TEMPERATURE RISE
IN TISSUES DURING HIGH-INTENSITY FOCUSED ULTRASOUND**

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Project Description

High-Intensity Focused Ultrasound (HIFU) is a minimally invasive surgical technique that has considerable potential in interventional medicine. The potential of HIFU has fueled significant research efforts, and a number of HIFU devices are under development or undergoing human trials. One of the important factors complicating the prediction of HIFU bioeffects is the effect of blood flow through large vessels. The presence of large vessels is assured during many important HIFU procedures, such as cancer treatment via vessel occlusion, hemostasis, ultrasound thrombolysis, or tumor ablation proximal to any significant vein or artery. At present little information is available for quantitatively evaluating the extent to which the interaction of the blood flow with the acoustic field alters the efficacy and safety of HIFU applications.

The specific aim of this project is to conduct research on the data acquisition of temperature field coupled with numerical calculations within tissues, with and without blood vessels, exposed to HIFU beam. The undergraduate student will assist our researchers who are developing the tool for characterizing HIFU transducers which are being used for interventional medicine.