

**School of Energy, Environmental, Biological and Medical Engineering
Biomedical Engineering Program
COLLEGE OF ENGINEERING AND APPLIED SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2012

The Biomedical Engineering Program is pleased to offer the following research project for the summer of 2012. 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: Working Towards Translation: Identification of a Biomaterial
for Tendon Tissue Engineered Constructs**

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Project Description

Soft tissue musculoskeletal injuries pose a burden on the US economy, with 16 million patients presenting with soft tissue injuries at a cost of \$30 billion/year. The prevalence of these injuries, and limited therapies available, has led to the emergence of tissue engineering approaches for tendon and ligament repair. Our lab has focused on improving tendon repair by designing and implanting tissue engineered constructs (TECs) into a rabbit patellar tendon (PT) defect. Despite prior successes, future work must focus on working among animal model systems, including mouse, rabbit, and sheep, in an effort to translate our work to the clinical environment. To begin the translation process, identifying a biomaterial and cell source to utilize for TEC creation is key to successfully completing the study. As such, the purpose of this project will be to investigate several biomaterials (including collagen, fibrin, and composites) to determine the material that produces optimal levels of linear stiffness and gene expression patterns using both murine and rabbit MPCs.

The role of the WISE student will be to perform basic cell culture duties including harvesting, seeding, passing, and feeding cells. She will also work to create TECs, feed and collect samples, implement biomechanical testing protocols, and work through the q-polymerase chain reaction procedure. Additional roles include developing an experimental design, analyzing data, and presenting data at lab meetings.