Department of Orthopaedic Surgery
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2016

The Department of Orthopaedic Surgery is pleased to offer the following research project for the summer of 2016. 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: Biomechanics of novel pediatric spine instrumentation

Professor Donita Bylski-Austrow, PhD
Department of Orthopaedic Surgery
CCHMC R-Bldg, R543R
Cincinnati, OH 45229-3039, ML 2017
Tel: (513) 803-2283
Fax: (513) 636-3928
Email: donita.bylski-austrow@cchmc.org

Project Description

The purpose of the Orthopaedic Research Laboratory at Cincinnati Children's is to improve the treatment, diagnosis, and prevention of musculoskeletal disorders of childhood and adolescence. Particular interests include the effects of mechanical forces on skeletal growth and medical device design and development. The student project will involve computer aided design, engineering analysis, test design, fabrication, and/or biomechanical testing of implants. One of two projects may be pursued.

The first focuses on young patients with severe spine deformities. These children require both correction of their spine curvature and preservation of spine growth to allow for continued development of their chest and lungs. Surgeons implant instrumentation, called growing rods, which both support the collapsing spine and distract it periodically to allow for growth. These constructs are prone to mechanical failure. The purpose of this study is to determine biomechanical properties of growing rod constructs explanted from patients in order to better design the constructs and develop criteria for when to replace or remove the devices.

The second project involves mechanical testing of flexible metal rods for fracture fixation of long bones. The rods are placed in the intramedullary canal across the fracture site. These rods are removed with a second surgical procedure after healing. Researchers at CCHMC and UC are working on the concept of a resorbable implant which would eliminate the second surgery. The purpose of this study is to determine mechanical properties of the new design, and compare the response to the current standard.