Division of Plastic Surgery
Department of Surgery
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 2, 2015

The Department of Surgery is pleased to offer the following research project for the summer of 2015. 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: Reduced Muscle Force and its Relation to Fiber Length

Professor Donna C. Jones
Department of Surgery, Division of Plastic Surgery
Location R.R509
Cincinnati, OH 45229-1020
Tel: (513) 803-0383
Fax: (513) 636-7182
Email: donna.jones1@cchmc.org

Project Description

I investigate questions regarding the determinants of bone development, function and shape. In particular, I focus on the influences of ontogeny, function and evolution on craniofacial morphology. It is my goal to apply the outcomes of this research directly to clinicians, assisting them in treating children with craniofacial abnormalities, either congenital or acquired, through translational and laboratory-based research endeavors. Recently, our lab has investigated how bone shape is altered by weakened muscle force produced through a change in food texture in a mouse model.

To determine the precise amount of muscle lost by the experimental diet, the next step will be to compare muscle fiber length from these experimental animals. For this project, animals will be weaned at 3 weeks of age to a hard (standard chow) or soft (DietGel7A) diet. When the animals are 10 weeks of age, data collection will involve digesting harvested muscles (masseter, temporalis, and ptyerigoids) and measuring fiber length. These, in addition to calculating the moment arms of the mandibles (as recorded from 3D reconstructions of the jaws, already collected), will provide the needed data determining the precise muscle loss associated with the change in bone shape.

For the course of the summer project, the student will be assisting with muscle digestion, fiber length measurements, and jaw measurements, and moment arm calculations. Training for each of these will be provided.