

**Department of Pediatrics
SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2013

The Department of Pediatrics is pleased to offer the following research project for the summer of 2013. 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: Development of Craniofacial Shape

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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:

Translational: Using shape analysis, we are characterizing quantifiable growth curves of craniofacial shape in children from three dimensional photographs. Results from this project are intended for use by clinicians during repair or reconstruction of facial features in future pediatric patients. One application for this work involves determining the benefits of helmet therapy in children with positional plagiocephaly (a condition where a portion of the skull is flattened).

Bench research: Working with *in vitro* cells and *in vivo* mouse models, we are examining how the interaction of muscle force influences the developing shape of bone, particularly in the mandible. Using a variety of cell markers, tension sensors, and morphological investigations, this research aims to improve our understanding of the cause of developmental abnormalities of the lower jaw, to hopefully reduce the need for surgeries and long hospital stays in children affected with these disorders.