

**Department of Surgery
COLLEGE OF Medicine**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2014

The Department of Surgery is pleased to offer the following research project for the summer of 2014. 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.

The role of primary cilia during craniofacial development

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Project Description

Craniofacial abnormalities are among the most common birth defects, accounting for approximately one third of congenital abnormalities. Individuals with craniofacial defects undergo multiple surgeries across a lifetime, even multiple surgeries a year. Our lab focuses on understanding the genetic and molecular events that occur in both normal and pathological cases of craniofacial development. Specifically our lab is interested in how the progenitor cells of the facial skeleton (neural crest cells) utilize a specific organelle, the primary cilium, to process molecular signals necessary for proper craniofacial development. Primary cilia are microtubule-based extensions that project off almost every cell type to receive and transduce molecular signals from the environment. Ciliopathies, diseases caused by aberrant cilia structure or function, comprise a wide spectrum of diseases that affect many organs systems and thus represent a significant biomedical burden.

We utilize transgenic murine models with aberrant primary cilia to investigate the molecular basis for craniofacial ciliopathies. We use *in situ* hybridization and immunohistochemistry to examine how loss of cilia on neural crest cells alters the mRNA and protein expression, respectively.