

**Department of Pediatrics
COLLEGE OF Medicine**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN
APPLICATION DEADLINE: March 1, 2011**

The Department of Pulmonary Biology is pleased to offer the following research project for the summer of 2011. 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.

**SIGNALING PATHWAYS THAT REGULATE FIBROBLAST
DIFFERENTIATION DURING LUNG REGENERATION**

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Project Description

The Perl lab utilizes various transgenic mouse models to study molecular mechanisms of lung regeneration. The goal of our research is to identify cellular programs and lung specific stem cells that are activated during lung repair. We have established two mouse models: one for the repair of the alveolar compartment, the compartment of air exchange and a second one for the bronchiolar compartment, these are the conducting airways. Identification of cellular programs, which are involved in lung regeneration, will be critical to advance research on pharmaceutical targets for the treatment of emphysema and chronic obstructive lung disease. The student will be able to choose one from the two projects.

1) We are currently investigating the role of myofibroblasts in alveolar regeneration and are using transgenic mouse models and pharmaceutical reagents (Imatinib) to block myofibroblast differentiation during regeneration after pneumonectomy. Experiments for the summer project will include: mouse breeding and genotyping, harvesting of lung tissue for RNA, FACS, histological analyses and morphometric studies. Subsequent analysis of lung tissue will include histological sectioning, histological stainings, immunohistochemistry and imaging by light and fluorescent microscopy.

2) Using a pharmaceutical approach (Tarceva) to block epidermal growth factor signaling we are currently investigating the role of this signaling pathway on airway inflammation and peribronchiolar fibrosis. Experiments for the summer project will include: mouse breeding and genotyping, harvesting of bronchiolar lavage and lung tissue for protein analysis using ELISA, histological analyses and morphometric studies.