

OBSTETRICS AND GYNECOLOGY, DIVISION OF MATERNAL-FETAL MEDICINE  
MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: 03/01/2024

PROJECT TITLE: Impact of amniotic fluid composition upon fetal lung and gastrointestinal tract development

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### Project Description

Our laboratory's work focuses on in utero treatment of fetal conditions. Our prior work has led to the creation of an artificial amniotic fluid for use in fetal interventions. We are now looking to further tailor amniotic fluid-based treatments to various disease states to better treat fetal conditions in-utero. The current project is centered on investigating how changes in the composition of amniotic fluid affect the development of the lungs and gastrointestinal tract in a fetal rodent model. This study is particularly relevant in understanding the physiological consequences of inflammatory insults in the fetus and amniotic membranes.

The research methodology includes working with rodents, primarily rats, to simulate and observe the effects of altered amniotic fluid compositions. The project encompasses a variety of laboratory techniques such as immunofluorescent microscopy, western blot analysis, RT-PCR, tissue processing, and tissue culture. Furthermore, this project will teach the student the ins and outs of proper animal care in research.

This opportunity is ideal for a student with a strong interest in translational research or innovation in medicine. It also is a great project for someone interested in becoming a physician-scientist. While some background knowledge or interest in molecular or developmental biology is

beneficial, it is not mandatory. Through this project, the student will not only develop technical expertise but more importantly, will gain insights into the development and testing of a hypothesis, a critical skill for a burgeoning researcher. I will personally work with the student on hypothesis developing and testing, and both my experienced research assistant and I will help the student with learning all technical aspects of the project.