

OBSTETRICS AND GYNECOLOGY, DIVISION OF MATERNAL-FETAL MEDICINE
MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2025

PROJECT TITLE: Placental therapies via intra-amniotic nanovesicle delivery

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Project Description

Treatment of in-utero fetal and placental conditions are often limited by the off-target effect of said treatments. For example, medical therapies for fetal conditions require the mother to be exposed to the medication at often supra-therapeutic doses to properly treat the fetus and/or pregnancy. This has led to significant interest in the role of nanovesicles and nanoparticles for in-utero therapies, as they can be targeted to tissues of interest. One particular area of interest is the placenta, as placental conditions such as fetal growth restriction and preeclampsia drive much of the morbidity that both mothers and neonates experience from high-risk pregnancies. We seek to evaluate the use of a Saposin C-Dioleoylphosphatidylserine nanovesicle, which targets rapidly dividing and apoptotic cells, such as those found in the placenta, to see if those nanovesicles, when injected intra-amniotic, properly localize to the placenta as well as examine the volume of distribution in off target tissue. Students will gain skills in flow cytometry and In Vivo Imaging Systems (IVIS).