



Name: Meghan Maguire

Email: mlmaguire@wisc.edu

Major Professor: Colin Jefcoate

Degree Objective: Ph.D. Endocrinology and Reproductive Physiology

Background: BS Biology Ursinus College, Collegeville, PA, MS Biomedical Science Napier University, Edinburgh, Scotland

Current Research Project:

Cytochrome P450 1b1 (Cyp1b1) is a mono-oxygenase enzyme which functions in the metabolism of various xenobiotics, particularly polycyclic aromatic hydrocarbons (PAHs). Its expression pattern spans numerous tissues including liver, brain, kidney, eye and breast. Recently, it has been shown that Cyp1b1 participates in the additional metabolism of estradiol and vitamin A (retinol). In particular, the conversion of retinol to retinaldehyde to the bioactive retinoic acid (RA) plays an important role in proper development throughout gestation in a highly regulated spatiotemporal manner. By using a vitamin A deficient (VAD) diet in both wild type and Cyp1b1-null mice, the relationship can be explored. Vitamin A deficiency induces a phenotype in which several craniofacial, ocular and limb deformities are present as well as impaired development of the kidney and genito-urinary tract, dependent on the degree and source of deficiency. While Cyp1b1-null mice are phenotypically normal throughout and exhibit seemingly normal pregnancies, the purpose of this research is to investigate the impact of a maternal VAD diet beginning at early gestation in the Cyp1b1-null pregnancy. It is hypothesized that the Cyp1b1 deletion will perturb or alter embryo development such that RA levels will diminish below a threshold when challenged with a maternal VAD diet. In situ hybridization and RT-PCR will be used to study the expression patterns of certain genes involved in RA metabolism and signaling at stages of development in which Cyp1b1 is normally highly active. Maternal supplementation with RA will also be carried out to assess the extent to which an embryo can be rescued from any aberrant development or improper signaling and to ensure that RA is the active agent inducing any changes in expression. This will lead to a better understanding of the role of Cyp1b1 throughout embryogenesis and development.

Honors:

Grants Received:

- ERP T32 Training Grant (5T32HD041921-08)

Publications:

National Presentations:

Other Presentations:



Maguire M and Jefcoate C. Flavonoids: A natural inhibitor of CYP1B1. *ERP Symposium*, 2012

ERP Service:

- Symposium Committee
- Seminar Committee
- Student Recruitment