

Research Summary of Dr. Eric George

My major areas of research interest are in gestational disorders, in particular preeclampsia and gestational hypertension. As the etiology and pathophysiology of preeclampsia are still poorly understood, my lab is primarily focused on understanding the downstream effects of placental insufficiency and ischemia-believed to be the central mechanism driving the symptomatic phase of the disorder.

Recently, the primary focus of the lab has been in determining the relevance of ischemia-driven production of extracellular remodeling factors. Notably this includes overproduction of the enzymes heparanase and matrix metalloproteinases. Currently, we are examining the biological effects of the cleavage products of these enzymes, and determining their role in inflammatory factor production. We have further identified a number of novel anti-angiogenic peptides produced by ischemic placental tissue which have not been previously described and we are actively investigating the biological mechanisms underlying them and their relevance in both our pre-clinical rodent model and the utility of these peptides as a biomarker in our UMC patient population.

While much remains obscure in regards to the pathophysiology of preeclampsia, a number of dysregulated proteins have been identified which are believed to be responsible for many of the maternal symptoms, in particular the anti-angiogenic protein sFlt-1. Therefore, a second major aim of the lab has been to develop peptide-based therapeutics targeting sFlt-1 and other identified factors utilizing a novel synthetic peptide delivery system which prevents fetal exposure of attached agents. We are also currently planning to expand the range of delivered agents to other disease states, such as improving fetal safety of chemotherapeutic agents during pregnancy.