



Name: Dr. Heather A. Bankowski, DO

Email: hkerrick@wisc.edu

Major Professor: Dr. Ian Bird

Degree Objective: MS. Endocrinology and Reproductive Physiology

Background: BA Biology and English, Indiana University, Bloomington , DO - A.T. Still University, Kirksville College of Osteopathic Medicine

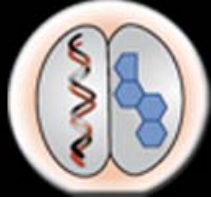
Current Research Project:

ALTERATIONS IN THE NITRIC OXIDE SYNTHASE (ENOS) PATHWAY OF HUMAN UMBILICAL VEIN ENDOTHELIUM OF NORMAL AND DIABETIC PREGNANCIES: Diabetes mellitus (DM) is characterized by vascular dysfunction. Normal human umbilical vein endothelial cells (HUVEC) develop vasodilatory adaptation to support fetal growth. The possibility exists that HUVEC of DM pregnancies may not develop this adaptation. The mechanism of this phenomenon is unclear but may result from altered eNOS activation and/or limited pool of active eNOS capable of nitric oxide (NO) production. This is the first investigation in humans which has sought to determine directly if there is a functional difference in eNOS activation between the HUVEC of DM and non-DM pregnancies. Methods of dual imaging of calcium [Ca²⁺] response to vasodilation and simultaneous NO production in uterine artery endothelium have been used to study the vasculature of normal and preeclamptic pregnancies. The same methods were used to determine endothelial dysfunction in DM pregnancies. Umbilical veins of normal (N=7) and DM (N=5) subjects were imaged using Fura-2 and DAF-2 to detect Ca²⁺ and NO in real time in response to stimulation with ATP (100 μ M). Recordings show that [Ca²⁺] signaling in the HUVEC of DM pregnancies is similar to that of normal pregnancy, with an initial peak followed by repeated Ca²⁺ bursts that are synchronized between cells. However, the sustained NO production that is characteristic of normal pregnancy is lacking in the DM HUVEC. This was also true in response to the pharmacologic stimulant ionomycin, suggesting there is a limitation at the level of eNOS activation, which contrasts findings in previous studies of HUVEC of preeclamptic pregnancies, where endothelial dysfunction is evident as a failure to signal at the level of [Ca²⁺]. We conclude that in DM pregnancies [Ca²⁺] signaling appears normal. The difference between normal and DM pregnancies is decreased production of NO, which appears to correlate with a smaller pool of bioactive eNOS. Such a failure to respond is consistent with direct damage to eNOS by reactive oxygen species (ROS), toxic substances known to be perpetuated by the hyperglycemic environment of DM.

Honors:

Kirksville College of Osteopathic Medicine, FM "Bucky" Walter Living Tribute Scholarship 2004

Kirksville College of Osteopathic Medicine, President's Leadership and Service Award



American College of Obstetricians and Gynecologists Congressional Leadership Conference, Scholarship recipient/attendee 2006,2007,2008,2009.

Grants Received:

OBGyn Research and Development Grant 2007-2010.

Publications:

District VI: Heather Kerrick DO. "How My Ob/Gyn Mentor Influenced Me" *Obstet Gynecol.* 2006 May;107(5):1187-94. PMID: 16648431

District VI: Heather Kerrick DO, "The Ob-Gyn Doctor-Patient Relationship: What It Means to Me" *Obstet Gynecol.* 2007 May;109(5):1223-31. PMID: 17470611

Kerrick H, Sheiner E, Mandell C, Pombar X, Hussey MJ, Strassner HT, Abramowicz JS. The Fetal Cheek-to-Cheek Diameter and Abdominal Circumference: Are They Correlated? *Arch Gynecol Obstet.* 2009 Oct;280(4):585-8. PMID: 19219447.

Iruretagoyena JI, Bankowski HA, Heiser T, Birkeland L, Grady M, Shah D. Outcomes for Fetal Echogenic Bowel during the Second Trimester Ultrasound. *J Matern Fetal Neonatal Med.* 2010 Jan 11. [Epub ahead of print] PMID: 20059439

Chapter 25 "Chronic Hypertension." Chapter revision, 6th Edition, Management of the High-Risk Pregnancy. Queenan, JT et al. In Preparation.

National Presentations:

Bankowski HA, Boedlt DS, Yi FX, Shah D and Bird IM (2011). Alterations of Calcium (Ca²⁺) Signaling In Human Umbilical Vein Endothelial Cells (HUVEC) Suggesting A Unique Vascular Adaptation In Pre-Existing Diabetes Mellitus (DM) Versus Gestational Diabetes Mellitus (GDM) Pregnancies. Submitted to the Society for Maternal Fetal Medicine (SMFM) Annual Meeting 2011.

Yi FX, Krupp J, Kerrick H, Shah D, Magness RR and Bird 1M (2010). Comparison of [Ca²⁺]_i and NO responses in vascular endothelium from pregnant sheep uterine artery and human preeclamptic umbilical vein. Society Gynecologic Investigation. 57th Annual Meeting (Abstract).

Bankowski HA, Yi FX, Bird IM, Shah D. (2010). Alterations in the nitric oxide synthase (eNOS) pathway of human umbilical vein endothelium of normal and diabetic pregnancies. Society for Maternal Fetal Medicine (SMFM) Annual Meeting 2010. (Abstract)

Kerrick H, Sheiner E, Mandell C, Guse D, Pombar X, Hussey MJ, Strassner HT, Abramowicz JS. (2009). Fetal Cheek to Cheek Diameter Measurement and Fetal Weight Estimation. Society for Maternal Fetal Medicine (SMFM) Annual Meeting, San Diego, CA. 2009 (Abstract)

Bankowski HA, Trampe B, Heiser T, Shah DM, Stewart K, Droste S. (2009) "A 3D tool for teaching sonographic assessment of fetal anatomy." Oral presentation at the American Institute for Ultrasound in Medicine (AIUM) Annual Meeting, New York, NY



Kerrick H, Pombar X, Shott S. (2008) "Identifying the Optimal Insulin Dosing Regimen for Glycemic Control in Pregnant Women with Diabetes Receiving Glucocorticoids for Fetal Lung Maturation." Oral presentation, North American Society for Obstetrical Medicine (NASOM) Annual Meeting, Washington DC.

Other Presentations:

Heather A. Bankowski, FuXian Yi, Ian M. Bird, Dinesh Shah. Alterations in the Nitric Oxide Synthase (eNOS) Pathway of Human Umbilical Vein Endothelium of Normal and Diabetic Pregnancies. ERP Annual Symposium 2010. Oral Presentation.

ERP Service: