Hello from the WHRC! It’s been a busy past few months with meetings and conferences. Congratulations to all of the WHRC members who have received awards in the past few months!

Please note that this Fall, October 12-14, 2011, the WHRC will host an international conference on campus at the Student Union, entitled: “Physiology of Cardiovascular Disease: Gender Disparities.” Please consider attending even if you don’t currently work in gender/sex differences studies. We are including talks from many areas of cardiovascular disease including pregnancy, renal disease, heart disease, neurological complications and depression. This is a wide-open field of investigation and you may find new ideas to incorporate into your own studies that include gender/sex differences. There is more about the program on page 3 of the newsletter. Also, we will provide grant support for registration fees for our UMMC faculty and trainees. Please consider submitting an abstract to the conference (deadline is June 20, 2011). There will be opportunities for junior faculty and trainees for oral and poster presentations based on abstract submissions.

As always, thank you for your support for the WHRC and have a restful, but productive summer!

Janie

From the Director: Jane F. Reckelhoff

WHRC Seminar
Dr. M. I. Ullah, M.D., M.P.H
“Testosterone Deficiency as a Risk Factor for Cardiovascular Disease”
Monday, June 6, 4 P.M., CW 106

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Our Mission: Women have health care issues that are different from men. Recent research indicates that there are sex differences in the incidence, outcome, and physiological and pathophysiological mechanisms responsible for various diseases. Mississippi has the dubious honor of having one of the highest incidence rates of cardiovascular disease, obesity, diabetes, hypertension, end-stage renal disease, high risk pregnancy, pre-eclampsia (pregnancy induced hypertension), infant mortality and poor child health outcomes in the United States. The Women’s Health Research Center (WHRC) was established in 2009 at the University of Mississippi Medical Center (UMMC) to accomplish the major goal of fostering excellence in basic and clinical research in issues that affect women’s health across their lifespan.
**Dr. Richard Roman, Ph.D.,** is the new chair of the Department of Pharmacology and Toxicology. Over the last 18 months, he has expanded the research focus and capabilities of his department. He has recruited 5 new NIH funded faculty members and strengthened departmental core facilities. Core facilities now include a new ABI 4000 LC/MS system for small molecules and lipidomics, a new ABI 5500 LC/MS system purchased with ARRA funding for protein work, and new Affymetrix GeneChip and GeneAtlas Instruments for Microarray and Genotyping to update the Institutions Genomics core. The research focus of his department now consists of a strong emphasis on cardiovascular, renal and metabolic disease, cancer, cell signaling and pharmacogenomics.

Dr. Roman’s own research interests focus on the genetic and environmental influences responsible for the development and progression of cardiovascular and renal disease. His laboratory explores the role of lipid mediators, specifically cytochrome P450 (CYP) metabolites of arachidonic acid in the regulation of renal function, vascular tone, angiogenesis and cell growth and proliferation. His laboratory has reported that inhibitors and receptor antagonists of a metabolite of arachidonic acid, 20-HETE, have therapeutic effects in the treatment of stroke, heart attacks, acute renal failure and in various forms of cancer. Dr. Roman is also interested in using genetically manipulated animal models to explore the genetic basis of hypertension and renal injury. His laboratory has found that transfer of regions of chromosomes 1, 5, and 13 attenuate the development of hypertension and renal injury in rat models. Transfer of regions of chromosomes 1, 5, and 7 attenuate the progression of diabetic nephropathy. Identification of the genes located within these chromosomal regions should provide new drug targets for the treatment of these diseases. Dr. Roman is also interested is pursuing the contribution of CYP metabolites to sex differences in cardiovascular/renal disease. In general, females are more protected against the development of hypertension and renal disease than men. Expression of the CYP isoforms varies by sex. Thus, CYP metabolites such as 20-HETE may play a key role in the mechanisms underlying sex differences in adult disease.
The Women's Health Research Center is proud to host the 2011 conference entitled “Physiology of Cardiovascular Disease: Gender Disparities” to be held in Jackson, Mississippi on October 12-14, 2011. This meeting is co-sponsored by the American Physiological Society and the Society for Women's Health Research.

The conference will provide a unique and intimate forum for investigators with similar scientific interests related to a clinically important area of research. The scientific program will begin with a plenary lecture entitled “From Stem Cells and Cadaveric Matrix to Engineered Organs” to be delivered by Dr. Doris Taylor, Ph.D. of the Stem Cell Institute at the University of Minnesota. The remainder of the meeting will consist of eight scientific sessions. The program will emphasize trainees and early career investigators and will provide important networking opportunities for all participants. The conference will also include a Trainee Workshop on “Careers in Physiology” to be presented by Dr. Jennifer Sasser from the University of Florida.

The abstract submission deadline is June 20, 2011, 11:59 PM EST. The link for abstract submission is: http://submissions.miracd.com/APSGender2011/login.asp. The registration deadline is September 12, 2011. The registration fee includes entry into all scientific sessions, opening reception, poster sessions and socials. Symposia include: I. Aging and Cardiovascular Disease, II. Gender Disparities in Renal Disease, III. Diabetes, Obesity and Cardiovascular Disease, IV. Neuromechanisms and Depression in Cardiovascular Disease, V. Gender Disparities in Cardiology, VI. Cardiovascular Disease and Inflammation, VII. Gender Differences in Vascular Function, and VIII. Cardiovascular Disease and Fertility.

All members of the WHRC are invited to attend this conference, and there will be awards available for UMMC investigators and trainees to pay registration fees. (details to follow).
Dr. Michael J. Ryan, Ph.D., an Associate Professor in the Department of Physiology, is the recipient of the American Society of Hypertension Young Scholars Award 2011. The Young Scholar Award recognizes the achievements of outstanding young investigators in the field of hypertension. The award session was held during the 26th Annual Scientific Meeting and Exposition in New York City, NY in May 2011. The award session included a lecture by Dr. Ryan highlighting his research focus on the mechanistic role that chronic inflammation has in the development of hypertension.

Congratulations to Dr. Sharon Lobert, Ph.D., R.N., Professor of Nursing and Biochemistry and Associate Dean for Research and Evaluation, and Dr. Laree Hiser, Ph.D., Associate Professor of Nursing, who were recently recognized as members of the Norman C. Nelson Order from the School of Nursing. The Order was established in 2004 to recognize faculty chosen by graduating students who provided the finest attention to student education.

Dr. Norma B. Ojeda, M.D., an Assistant Professor in the Department of Pediatrics, is the inaugural winner of the Michael LeBlanc Award, a faculty research award from the Blair E. Batson Hospital for Children at UMMC. Dr. LeBlanc was a Professor of Pediatrics (Neonatology) and this award was established in honor of Dr. LeBlanc’s many accomplishments in research including publications and research awards.
Dr. Kedra Wallace, Ph.D., a post-doctoral research fellow in the laboratory of Dr. Babbettte LaMarca in the Department of OB-GYN, was recognized as a finalist for the Juan Carlos Romero and Water & Electrolyte Homeostasis Section Postdoctoral Research Recognition Award presented at Experimental Biology 2011 in Washington, DC in April. Dr. Wallace presented an oral presentation in conjunction with her award that featured her work on the role of CD4+T lymphocyte activation in response to placental ischemia in mediating hypertension during pregnancy. Pictured from left to right are finalist Tifanny Thai, Jane F. Reckelhoff, Chair of the W&E Section and Director of the WHRC at UMMC, finalist Analia Loria, and finalist Kedra Wallace.

Dr. Keisa W. Mathis, Ph.D., a post-doctoral research fellow in the laboratory of Dr. Michael J. Ryan in the Department of Physiology, was a recipient of two awards at the recent Experimental Biology meeting held in Washington, D.C. Dr. Mathis was awarded a Caroline tum Suden/ Frances A. Hellebrandt Professional Opportunity Award presented by the Women in Physiology Committee of the American Physiological Society. Dr. Mathis was also a recipient of a FASEB / MARC Award. The FASEB MARC Program provides funding for travel awards to defray meeting registration and travel-related expenses for eligible underrepresented minority undergraduate and graduate students, post-doctorates, junior faculty and mentors in the biomedical and behavioral sciences.
The following graduate students in the UMMC School of Graduate Studies in the Health Sciences were recognized at the recent HONORS DAY PROGRAM held Amy 5, 2011.

*Marilyn Burke*, a Ph.D. student in the laboratory of Dr. Richard Roman in the Department of Pharmacology, *Ashlyn Harmon*, a Ph.D. student in the laboratory of Dr. Mike Garrett in the Department of Pharmacology, *Tamara Glenn*, a M.D./Ph.D. student in the laboratory of Dr. Ian Paul in the Department of Neurosciences, and *Deborah Davis*, a Ph.D. student in the laboratory of Dr. Jane Reckelhoff in the Department of Physiology, were recognized as recipients of the Dean’s Scholarship. This full-tuition recruitment scholarship is awarded to a student for outstanding academic achievement in the Ph.D. Program at UMMC.

*Emily Gilbert*, a M.D./Ph.D. student in the laboratory of Dr. Michael Ryan in the Department of Physiology, was recognized as a recipient of the Wallace Connerly, M.D. Scholarship. This stipend, established in 2002, provides a stipend and full tuition for a medical student enrolled in the M.D./Ph.D. Program at UMMC.

*Joshua Speed*, a graduate student in the laboratory of Dr. Joey P. Granger in the Department of Physiology, was recognized for his receipt of the Caroline tum Soden/ Frances A. Hellebrandt Professional Opportunity Award presented at the Experimental Biology 2011 meeting by the American Physiological Society.

*Nidhi Khatari*, a Ph.D. student in the laboratory of Dr. Ian Paul in the Department of Pharmacology and Toxicology, was recognized for her induction into the Sigma Xi Honorary Society.

*Carlos Zgheib*, a Ph.D. student in the laboratory of Dr. George Booz in the Department of Pharmacology and Toxicology, was recognized for his induction into the Phi Kappa Phi Honor Society.

*Fouad Zouein*, a Ph.D. student in the laboratory of Dr. George Booz in the Department of Pharmacology and Toxicology, received the 2011 Fundamentals of Physiology Award. This award is presented to the student who achieved the highest grade point average in the Fundamentals of Physiology Course during the 2010-2011 academic year.
Melanie Hill an undergraduate student researcher working in the laboratory of Dr. Bettye Sue Hennington in the Department of Biology at Tougaloo College received a travel award to attend and present her work at the Emerging Researchers Network sponsored by the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) held this spring in Washington, D.C. Melanie Hill is also a 2011 recipient of a stipend/scholarship from the Undergraduate Research Mentoring Program at Tougaloo College in conjunction with Mississippi State University.

Lateia Taylor, an undergraduate student researcher working in the laboratory of Dr. Bettye Sue Hennington in the Department of Biology at Tougaloo College, also received a travel award to attend and present her work at the Emerging Researchers Network sponsored by the HBCU-UP held this spring in Washington, D.C.

Emily Gilbert, a second year M.D./Ph.D. student working with Dr. Michael J. Ryan has published her first paper in Gender Medicine (2011;8:150-155) entitled, “High dietary fat promotes visceral obesity and impaired endothelial function in female mice with systemic lupus erythematosus.” Emily began her interest in science as a summer intern and a participant in the SURE program sponsored by the School of Graduate Studies in the Health Sciences. Her study suggests that dietary fat accelerates renal injury and vascular dysfunction in a disease model of systemic lupus erythematosus, (SLE) a chronic autoimmune inflammatory disorder that predominately affects young women.

Obese postmenopausal women have a 50% higher risk of breast cancer than non-obese women; yet, the mechanism remains unknown. This study utilized age-relevant C57BL/6 mice ovariectomized and exposed to a high-fat versus a low-fat diet to mimic postmenopausal obesity. Mice were injected with E0771, mouse breast cancer cells, and tumor size and VEGF expression were monitored. An increase in plasma VEGF and VEGF levels in the visceral fat were associated with a two-fold increase in visceral fat/body weight. Breast tumor weight was increased in the obese ovariectomized mice suggesting that postmenopausal obesity promotes tumor angiogenesis and breast cancer progression though an increase in adipose tissue mass and adipokines such as VEGF.


Previous studies show that introgression of chromosome 13 from the Brown Norway rat into the salt-sensitive (SS) genetic background attenuates the development of hypertension in a SS-13 BN consomic strain; however, the genes and pathways involved remain to be identified. The aim of this study was to narrow the region of interest on chromosome 13 and results identified a segment containing 13 genes, of which 4 were differentially expressed in the kidney of strains partially protected from the development of hypertension. None of the genes in this region have any known relation to the regulation of blood pressure. Thus, further studies will determine which of these genes are mechanistically related to the development of hypertension in the SS rat providing new insight into the pathogenesis of SS hypertension.

Women's health issues are underfunded and understudied. Help support women’s health research by making a tax-deductible contribution. For more information contact the Development Office at UMMC at 601-815-7473. Your help is greatly appreciated!

Recent epidemiologic studies report that smoking has a negative impact on renal function and elevates the renal risk not only in the renal patient, but also in the healthy population. While the impact on chronic renal disease has been previously characterized, the impact on acute kidney injury is virtually unknown. Thus, the aim of this study was to determine the effects of chronic nicotine exposure on acute renal ischemic injury. Chronic nicotine treatment increased production of reactive oxygen species and provoked injury via c-jun-N-terminal kinase-mediated activation of the AP-1 transcription factor. These results imply that smoking may sensitize the kidney to ischemic insults and perhaps facilitate progression of acute kidney injury to chronic kidney injury.


Polycystic ovary disease (PCOS), the most common reproductive dysfunction in premenopausal women, is also associated with an increased risk for cardiovascular disease. The aim of this study was to characterize the consequences of hyperandrogenemia (HAF) in the female SD rat. A 3-fold increase in plasma dihydrotestosterone led to estrous cycle dysfunction associated with increased food intake, body weight, visceral fat, arterial pressure, albuminuria, and renal injury; insulin resistance and metabolic dysfunction were also present in the HAF rats. Thus, the HAF rat is a unique model that exhibits many of the characteristics of women with PCOS and will be a useful model for study of the mechanisms responsible for PCOS-mediated hypertension.