2011 looks to bring many new exciting advances in the WHRC. We will begin our Distinguished Lecture Series with a talk by Dr. Kathryn Sandberg, who is a pioneer in the study of sex differences in cardiovascular disease using a mouse model in which she can separate sex steroid from chromosomal effects. See the advertisement on page 4 in this newsletter for more information.

Mark your calendars! This fall we will hold our first international meeting sponsored by the WHRC. Scheduled for October 12-14, 2011, it will be entitled, “Physiology of Cardiovascular Disease: Gender Disparities.” The program will include discussion of research in women’s health and sex differences from stem cells to clinical trials. Notice that the registration will include all meals and social functions, making this conference a great deal! Reduced rates are offered for students and fellows.

Janie

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.
In 2010, Dr. Ian A. Paul, Ph.D., Director of the Graduate Training Program in Neuroscience, established the Rodent Behavioral Core Facility (RBC) for the Center for Psychiatric Neuroscience. This facility and its staff helps investigators test a wide variety of behaviors in rodents, ranging from complex learned behaviors to basic neurological functions and developmental milestones. It is equipped with state of the art video acquisition and analysis equipment, infrared activity monitors and equipment for detecting thermal pain sensitivity.

Originally intended for the neuroscience research community at UMMC, the RBC can assist with the development and implementation of tests used to detect anxiety, preference for reward, and learning and aggression in rodents. The RBC, funded by the National Center for Research Resource, is a core resource that is available to the wider UMMC biomedical research community. The facility can be used to improve data collection for ongoing studies or to develop behavioral approaches to investigation or treatment.

In fact, many of the experimental procedures and animal models in common use in biomedical research have a major impact on rodent behavior. Recently, his group, in collaboration with Dr. Barbara T. Alexander in Physiology & Biophysics, discovered that this paradigm has profound effects on renal development and fluid homeostasis. His experiences have led him to be fascinated by the complex interplay of CNS and somatic systems and he hopes to use the RBC to help other UMMC investigators explore these connections in their biomedical research.

Dr. Paul is a Professor of Psychiatry & Human Behavior and member of the WHRC. He trained in neurobiology at the University of North Carolina at Chapel Hill and in neuropharmacology at the NIH and has led a laboratory focusing on behavioral neuropharmacology at UMMC since 1993. Previous work has centered upon learning and memory deficits in a mouse model of AIDS dementia and the role of glutamate neurons in the behavioral actions of antidepressants in rats. Currently, he is investigating the neurodevelopmental effects of early life exposure of rats to selective serotonin reuptake inhibiting antidepressants as a model of autistic spectrum disorders.
**Kudos**

Dr. Jan M. Williams, Ph.D., Assistant Professor in the Department of Pharmacology and Toxicology at UMMC, is the recent recipient of Research Starter Grant from the PhRMA Foundation Pharmacology/Toxicology for his project entitled, “Mechanism of Matrix Metalloproteinases in Diabetic Nephropathy.” His project will utilize the newly developed Type 2 Diabetic Nephropathy (T2DN) rat that develops renal injury and progressive proteinuria to investigate the mechanisms by which blockade of the matrix metalloproteinases-2 protein attenuates progression of diabetes-induced renal disease. The mission of the PhRMA Foundation is to provide support to young scientists by awarding competitive research fellowships and grants. The PhRMA Foundation has supported numerous young pharmaceutical scientists for over 45 years in areas of research related to drug discovery and development.

Dr. Jan Williams

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**IN THE NEWS**

Dr. Kedra Wallace, Ph.D., a post-doctoral research fellow in the laboratory of Dr. Babbette LaMarca in the Department of Obstetrics & Gynecology, is a finalist for the Juan Carlos Romero and Water & Electrolyte Homeostasis Section Postdoctoral Research Recognition Award. This award provides support for travel expenses for junior investigators to attend the annual Experimental Biology Meeting.

Dr. Keisa W. Mathis, Ph.D., a post-doctoral research fellow in the laboratory of Dr. Michael J. Ryan in the Department of Physiology, is a recipient of the annual Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award presented by the Women in Physiology Committee of the American Physiological Society. Dr. Mathis will receive her award at the Experimental Biology meeting to be held in April in Washington, D.C.
Dr. Kathryn Sandberg, Ph.D, will present the first Women’s health Research Center Distinguished Lecture series to be held on Monday, February 28 at 4 p.m. in the Class Room Wing, Room CW106.

Dr. Sandberg is a Professor of Nephrology and Hypertension in the Department of Medicine at Georgetown University in Washington, D.C. She has a strong research interest in understanding the fundamental biological differences between men and women in cardiovascular disease. She is the founder and Director of the Center for the Study of Sex Differences in Health, Aging and Disease (CSD) at Georgetown University. The mission of the CSD is to foster and promote collaborative interactions, enhance opportunities for funding and enhance training opportunities for center members that have a common interest in the impact of sex differences on health, aging and disease.

This will also be the first Go Red for Women lecture sponsored by the WHRC. Heart disease is the number 1 killer of women. February is American Heart Month and the Go Red for Women movement has as its mission to encourage awareness of the issue of women and heart disease and to make sure women know they are at risk so they can take action to protect their health in order to save more lives.

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!
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, co-sponsored by the American Physiological Society, Women’s Health Research Center, and the Society for Women’s Health Research will bring research scientists and clinicians together to discuss the latest issues in cardiovascular disease, including the effect it has on the brain, kidneys, and other organ systems.

The plenary lecture for the conference, “From Stem Cells and Cadaveric Matrix to Engineered Organs” will be presented by Dr. Doris Taylor, Ph.D. of the Stem Cell Institute at the University of Minnesota. Dr. Taylor is the Medtronic-Bakken Chair in Cardiac Repair and she is also the Director of the Center for Cardiovascular Repair. Dr. Taylor’s research focuses on cell therapy to treat disease in both laboratory and clinical studies.

This is the fourth in a series of conferences on sex steroids and gender in physiology. This conference also provides a career workshop and extensive opportunities for networking for Young Investigators. The registration fee includes entry to all scientific sessions, poster sessions, and social events and will coincide with the grand opening of the new state-of-the-art Women’s Health Research Center at UMMC. The deadline for submission of abstracts is June 20, 2011.
**Recent Publications**


Chronic inflammation is implicated in the pathology of hypertension; however, the role for specific cytokines remains unclear. Systemic lupus erythematosus (SLE) is a chronic autoimmune inflammatory disorder that predominantly affects women during their reproductive years. Although women with SLE have hypertension, the underlying mechanisms for this have not been examined. In this study, Venegas-Pont et al. tested whether tumor necrosis factor-α blockade with etanercept (Etan) reduced mean arterial pressure in a female mouse model of SLE. Data from this study suggest that TNF-α mechanistically contributes to the development of hypertension in a chronic inflammatory disease through increased renal nuclear factor κB, oxidative stress, and inflammation.


Recent work has established that proangiogenic and antiangiogenic factors such as VEGF and the soluble VEGF receptor fms-like tyrosine kinase-1 (sFlt-1) are directly influenced by hypoxia in placental ischemia. While adenosine may be an important regulator of VEGF in vascular tissue, the importance of adenosine in regulating VEGF and sFlt-1 in placental tissue is unclear. In this study George et al., investigated the role of adenosine in the secretion of VEGF and sFlt-1 in placental villous explants. Using the nonspecific adenosine receptor antagonist, 8-sulphophenyltheophylline (8SPT) and the adenosine transporter inhibitor dipyridamole which increases extracellular levels of adenosine, this study indicated that extracellular adenosine can regulate VEGF and sFlt-1 secretion in the hypoxic placenta suggesting it may contribute to the balance of these competing angiogenic factors in diseases characterized by placental ischemia.

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**Mark your calendar!!**

The Organization for the Study of Sex Differences will hold its **Fifth Annual Meeting** June 2-4, 2011 in Oklahoma City, OK. This meeting will offer researchers from across all biomedical research areas and disciplines the opportunity to present and discuss sex differences research.
Factors contributing to the development of hypertension and diabetic nephropathy remain poorly understood. Regardless of the factors that initiate the renal injury, the progression to ESRD ultimately results in excess accumulation of extracellular matrix leading to glomerulosclerosis, renal interstitial fibrosis, tubular atrophy, and renal insufficiency. Control of the accumulation of extracellular matrix in the kidney is thought to be determined by the balance between the synthesis of matrix and its degradation by metalloproteases (MMPs). To determine whether two new selective MMP inhibitors, XL081 and XL784, could oppose the progression of renal damage, MMP inhibitors were given either alone or in combination with lisinopril and losartan in two different rat models of hypertension, the (Dahl S) and the diabetic- (T2DN) nephropathy. Results from this study indicate that chronic administration of selective MMP inhibitors have the potential to delay the progression, and may even reverse, hypertension and diabetic nephropathy. They further suggest that activation of certain MMPs may play an important role in the development of glomerulosclerosis, tubular atrophy, and interstitial fibrosis in hypertension and diabetic-induced nephropathy.


The objective of this study was to evaluate the effectiveness of the Mississippi Protocol (MP) to treat HELLP (hemolysis, elevated liver enzymes, and low platelets) syndrome. The current investigation added emphasis on reducing systolic blood pressure to less than 160 mmHg in addition to IV infused magnesium sulfate and dexamethasone, and concluded that early initiation of MP inhibits HELLP syndrome disease progression and severity.