



# OBESITY RESEARCH NEWS

AT THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Vol. 4 Issue 1 | SUMMER 2016

## MCOR answers call for action on obesity epidemic

Obesity and associated chronic diseases continue to be a major challenge to our health-care system in Mississippi.

During the last 20-30 years the prevalence of obesity has continued to increase in Mississippi and in most of the United States and the rest of the world. More than 65 percent of adults and 40 percent of children in Mississippi are overweight or obese. This is a concern because approximately 80 percent of overweight children become overweight or obese adults.

As a result of this rising obesity prevalence, health-care professionals are seeing significant increases in chronic illnesses in children, such as diabetes, hypertension and kidney disease. Twenty or 30 years ago, these diseases were almost exclusively found in adults.

Especially alarming are the results of recent research suggesting that obesity in parents may be transmitted to their children through programming of the developing fetus, as well as epigenetic modifications that contribute to obesity in future generations. This "transgenerational" programming of obesity is not inevitable and can be prevented if parents maintain a healthy weight.

These observations highlight the importance of the MCOR mission to improve lives through discoveries, education, improved patient care and prevention of obesity and related disorders. I highlight the importance of prevention because of the potential impact of parental obesity on the health of future generations, and because substantial, sustained weight loss is so difficult to achieve for most people once they become obese. Therefore, a major focus of the MCOR in the future will be developing better strategies for obesity prevention and expanding the science knowledge base for improved treatments.

This newsletter summarizes a few activities of the MCOR and UMMC clinical programs during the past several months. UMMC clinical programs in obesity and weight management have expanded and plans are already underway to provide services to communities across the state under the leadership of Dr. Dan Jones, director of clinical and population sciences for the MCOR. Dr. Joshua Mann, chair of the newly formed Department of Preventive Medicine, has led the development of an employee wellness program for UMMC and plans are being made to refer UMMC patients to wellness programs.

Finally, we are especially excited that the UMMC Bariatric Surgery Program, led by Dr. Ken Vick and Adam Dungey, has received accreditation from the American College of Surgeons. This accolade assures patients that the program meets the highest standards for patient care and quality of care. Congratulations to all of those who were involved

in obtaining this important milestone for obesity treatment at UMMC.

This has also been an exciting year for MCOR research programs. Just this past month, UMMC received notification that its application for an obesity-focused Mississippi Center for Clinical and Translational Research (CCTR) would be funded by the National Institutes of Health (NIH). The CCTR, led by Dr. James Wilson, professor of physiology and biophysics, will provide the infrastructure needed to develop a cadre of clinical and population science investigators to address obesity and related disorders in Mississippi.

UMMC also received continued NIH funding for the Center of Biomedical Research Excellence (COBRE), which focuses on obesity research and currently supports the work of 10 investigators in six different departments at UMMC. A few highlights from UMMC researchers are provided in this newsletter and a much more extensive list of papers published, extramural funding and other news can be found on the MCOR website at <https://www.umm.edu/mcor/>.

We are grateful for the support from MCOR benefactors and the continued support from the NIH, the American Heart Association and other national funding agencies for our research programs. We express our gratitude to the researchers, health-care professionals and support staff members who have worked so hard to advance the mission of the MCOR.

Please contact us if you have questions regarding MCOR programs. We hope that you enjoy reading this newsletter and greatly appreciate your support.



Dr. John E. Hall

John E. Hall, Ph.D.  
Arthur C. Guyton Professor and Chair  
Director, Mississippi Center for Obesity Research

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## Clinical, population science group makes strides

The work of the clinical and population science group in the MCOR is supported by the clinical programs in obesity and weight management. These clinical programs operate under the umbrella of the University of Mississippi Medical Center Weight Management Program.

Services through the program include medical evaluation for overweight and obesity and prevention and treatment programs for these conditions, including medical treatment and bariatric surgery. Services to patients and communities are provided by a multidisciplinary team, including general internists, bariatric surgeons, endocrinologists, cardiologists, pediatricians, pediatric gastroenterologists, psychologists, registered dietitians and nutritionists, exercise physiologists, administrators, and others.

Care is provided for patients in various areas at the Medical Center and at off-campus sites. In a year or so, most of our clinical programs will be consolidated into a facility in a UMMC Wellness Center location on Old Canton Road (the former North Jackson Courthouse location). Plans are underway to provide these services to individuals and communities across the state beginning in Lexington and Grenada. Services there will be delivered both face-to-face and through our remarkable Telehealth Program.

Research in progress or in the planning stages include: a) early childhood education as a tool for preventing childhood obesity; b) utility of bariatric surgery in the management of obesity-associated heart failure with preserved ventricular function; c) utility of bariatric surgery as part of a treatment plan for renal transplant in patients with obesity and renal



Dr. Daniel W. Jones

failure; and d) several community health partnerships.

Clinical research also is being conducted in the Wellness and Weight Management Clinic, UMMC's pediatric obesity multidisciplinary outpatient clinic. Specifically, families are currently participating in a family group project that focuses on teaching children and parents behavioral skills associated with eating healthier and engaging in increased physical activity, as well as sampling healthy snack foods. Providers in the clinic also have ongoing projects

examining barriers to child and parent engagement in healthy lifestyle behaviors and examining outcomes associated with patients being treated for obesity in the clinic.

A critical element of the work of the clinical and population group is supporting the work of our basic science colleagues. While we work to better implement what we already know, we will continue to be a part of the search for better options of prevention and treatment through science.

Daniel W. Jones, M.D.  
Sanderson Chair in Obesity,  
Metabolic Diseases and Nutrition  
Director, Clinical and Population Science, MCOR  
Professor of Medicine and Physiology  
Interim Chair, Department of Medicine

## MCOR faculty earn recognition at research award ceremony

The Excellence in Research Awards Program at the University of Mississippi Medical Center recognizes investigators who have been successful in attracting extramural funding for their research programs. Below are faculty from the MCOR who received awards at the annual ceremony on Nov. 4, 2015.

### Platinum Medallion - \$5 million received in extramural funding

- Dr. Barbara T. Alexander, professor of physiology and biophysics; and
- Dr. Adolfo Correa, chief science officer, director and principal investigator of the Jackson Heart Study, professor of medicine and professor of pediatrics.

### Silver Medallion - \$500,000 received in extramural funding

- Dr. Eric George, assistant professor of physiology and biophysics; and
- Dr. Andrew D. Smith, associate professor of radiology.

### Bronze Medallion - \$250,000 received in extramural funding

- Dr. Bettina M. Beech, dean of the School of Population Health, professor of pediatrics, professor of family medicine and executive director of the Myrlie Evers-Williams Institute for the Elimination of Health Disparities;

- Dr. Lique Coolen, professor of physiology and biophysics; Associate Dean for Postdoctoral Studies in the School of Graduate Studies in Health Sciences; and
- Dr. Romain Harmancey, assistant professor of physiology and biophysics.

### Meritorious Research Service Core Leader:

- Dr. Michael R. Garrett, professor of pharmacology and toxicology.

### Translational Research Team:

- Dr. Merry L. Lindsey, professor of physiology and biophysics; and
- Dr. Michael E. Hall, assistant professor of medicine.

## National accreditation adds prominence to bariatric surgery program

UMMC's bariatric surgery program has been accredited by the American College of Surgeons.

The national accolade comes from the college's Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program. UMMC received notification of the accreditation in July, signifying that its program meets essential criteria for staffing, training and facility infrastructure and protocols for care, ensuring its ability to support patients with severe obesity.

The accreditation "also signifies our commitment to reporting our outcomes from surgery and to ensure that those outcomes meet, or are better than, national averages," said Dr. Kenneth Vick, associate professor of surgery and a key player in the growth of UMMC's bariatric surgery program.

Bariatric surgery offers morbidly obese patients the option of more rapid weight loss than conventional diets can provide. It can save the lives of patients who suffer from obesity-related diseases, such as type 2 diabetes, high blood pressure and heart disease. Life expectancy and quality of life are dramatically improved, and other related conditions, such as acid reflux and sleep apnea, can disappear.

Bariatric surgery patients include Chanci Stewart of Ridgeland, who feared she'd be dead within five years because of health issues she suffered at 290 pounds.

Nine months after Vick performed her vertical-sleeve gastrectomy - also known as a gastric sleeve - in March 2015 at UMMC, Stewart is 140 pounds lighter and says she "feels great." She's exercising regularly and eating a healthy diet, two lifestyle habits emphasized by the Medical Center's bariatric surgery program.



Dr. Kenneth Vick, associate professor of surgery and a key player in the growth of UMMC's bariatric surgery program, chats with patient Chanci Stewart of Ridgeland, who lost 140 pounds after undergoing bariatric surgery at UMMC.

"I get to see my kids grow up," the mother of four said.

The Medical Center's bariatric surgery program, a collaboration with the MCOR, completed 60 surgeries in 2015, including 55 gastric sleeves, three adjustable gastric bands and two gastric bypasses.

"We hope that receiving this accreditation will expand our role in the state as a leader in health care," Vick said.

Centers receiving accreditation must ensure that their bariatric surgical patients receive a multidisciplinary program - not just a surgical procedure - that will improve patient outcomes and long-term success. Accredited centers offer preoperative and postoperative care designed specifically for their severely obese patients.

Vick said the new accreditation "also expands access to bariatric surgery for our patients, as many insurance organizations require this designation for coverage of services. Patients can expect safe, compassionate, efficient care when they choose our program, and know that UMMC has all of the resources and personnel to deliver the best possible care for obese patients 24 hours a day, 7 days per week, 365 days per year."

For information on UMMC's bariatric surgery and weight management programs, visit <https://www.ummchealth.com/weight/> or [https://www.umc.edu/education/schools/medicine/clinical\\_science/surgery/clinical\\_services\(surgery\)/bariatric\\_surgery.aspx](https://www.umc.edu/education/schools/medicine/clinical_science/surgery/clinical_services(surgery)/bariatric_surgery.aspx).

## Making strides: Wellness centers bolster employee health initiatives

Significant progress has been made this year in developing a comprehensive employee wellness program at UMMC.



Mann

That progress includes completing and submitting the Centers for Disease Control's online workplace health scorecard, conducting onsite wellness educational sessions, working in partnership with the American Heart Association to provide healthier options in beverage vending machines and observing the AHA's National Walking Day for the first time.

An Employee Wellness Committee has been meeting regularly to investigate additional opportunities to promote health among UMMC employees. UMMC also has joined the Mississippi Business Group on Health, a coalition of employers and partners working together to learn, discuss and share knowledge in employee health and health care.

### University Wellness Centers

Since summer 2015, the MCOR has made progress with UMMC's University Wellness Centers. In February, a Medical Advisory Committee (MAC) was established to oversee safety protocols and assist in the implementation of medical fitness programs. In May, several UMMC team members visited three medically integrated wellness centers in Michigan to learn best practices.

A wellness interest survey was sent to University Wellness Center members. In June, the MCOR hosted the first wellness educational session for University Wellness Center members and the community. The session was presented by Dr. Robert McGuire, who spoke about bone health and how it relates to wellness.



The downtown Jackson branch of the University Wellness Center features new signs, equipment and interior updates.

The MCOR's next steps will include finalizing referral pathways for UMMC patients to UMMC Wellness Center programs, facilitating the placement of clinical services at one or more wellness center locations and applying for Medical Fitness Association certification in the summer or fall of 2017.

# UMMC receives record award to combat state's obesity epidemic

By Karen Bascom

One-third of Mississippi adults are obese. So are one-fifth of the state's children.

It's an epidemic impossible to understate. Be it caused by diet, lack of exercise, genetics or environment - or any combination of those - there is no quick fix for a health condition affecting one million Mississippians.

However, there are steps that can be taken, and the University of Mississippi Medical Center is about to take 20 million of them.

Last month, the Medical Center received its largest single award ever to confront obesity and create a healthier Mississippi. The five-year, \$19.9 million award from the National Institutes of Health will fund the Mississippi Center for Clinical and Translational Research (CCTR).

Supported by the Institutional Development Award Program, the CCTR's mission is the prevention, diagnosis and treatment of obesity and related health conditions.

"Mississippi has the highest rate of obesity in the United States," said Dr. James Wilson, professor of physiology and biophysics and the project's lead investigator. "High blood pressure, diabetes, chronic kidney disease and cardiovascular disease are all associated with this one preventable cause."

Obesity also increases a person's risk of stroke, certain cancers and neurological disorders. Combined, obesity-related illnesses cost the United States an estimated \$150 billion each year.

To address this problem, health scientists need an approach that brings their research from the laboratory bench to the greater population. This new award enhances UMMC's ability to conduct clinical and translational research.

"Translational research takes basic science findings and uses them to develop interventions that will affect treatment options and public health," Wilson said.

These could be community programs, such as healthy-eating initiatives. Alternatively, they could be pharmaceuticals that treat diabetes. The new award does not fund particular projects; instead, the CCTR will invest in the people who will find solutions.

"A significant mission of the program will be to train junior faculty into established investigators," Wilson said.

Training will come from the CCTR's Professional Development Core, which will mentor junior faculty who conduct obesity-related research. In addition, the Pilot Projects Program will fund promising studies while those researchers seek outside funding to sustain their activities.

"One of the major goals is to provide a coordinated program of mentorship and support that will facilitate the work of translational researchers who will tackle the epidemic of obesity," said Dr. John Hall, Arthur C. Guyton Professor and Chair of Physiology and Biophysics and a leader of the Professional Development Core. "The overarching goal is to improve lives through discovery, innovation, education, better patient care and prevention of obesity and related disorders."

Dr. Richard Summers, associate vice chancellor for research, emphasized the importance of developing new talent to spur clinical research - a theme present throughout UMMC's history.

"When the Medical Center was built in 1955, most of the faculty who formed our early clinical research programs were young investigators," Summers said. Organ transplant pioneer Dr. James Hardy was 37 in 1955; cardiovascular physiologist Dr. Arthur Guyton was 36. "Our goal is to build a pipeline of investigators and clinical research for years to come."

Dr. Jeffrey Vitter, University of Mississippi chancellor, extended his congratulations to the Medical Center for receiving the award.

"We are honored by this NIH investment to substantially enhance our capacity and success in translating research discoveries and innovations to better health outcomes," Vitter said.

Strong basic research programs in cardiovascular function and disease give UMMC a starting point for clinical applications. Recent infrastructure enhancements will advance clinical and

translational research capabilities, Wilson said. These include the Center for Bioinformatics and Biostatistics, an Enterprise Data Warehouse and a Clinical Research Support Program.

"All of these pieces brought together give UMMC the infrastructure to enhance clinical research," Summers said.

When two campus construction projects - one nearly complete and the other in the planning stages - wrap up, UMMC will have a full set of physical tools needed for the CCTR's success.

"The timing of this magnificent grant couldn't be better as it coincides with the development of our Translational Research Center and Clinical Research Unit in the University Hospital, facilities that will be crucial to our success in clinical and translational research," said Dr. LouAnn Woodward, vice chancellor for health affairs. "We look forward to putting these assets to work in the cause of discovering tomorrow's treatments and cures."

However, UMMC cannot solve the obesity epidemic in Mississippi on its own. Tougaloo College and the University of Southern Mississippi will be CCTR collaborators.

"Those institutions will be key in community outreach efforts," Wilson said.

The CCTR also will work with two other NIH-funded clinical and translational research centers: The Mayo Clinic in Rochester, Minnesota, and the Pennington Biomedical Research Center in Baton Rouge, Louisiana. Pennington has expertise in nutrition and metabolism, important to understanding obesity, while UMMC and Mayo entered into a collaborative agreement in 2014 that allows the institutions to share data tools and trial participants. Close ties have already developed around cancer research.

"In five years, we hope to have 10 or more junior investigators successfully funded as a direct result of this grant," and on a trajectory to independent obesity research programs, Wilson said. "As an additional result, we hope to recruit senior-level population and clinical investigators with the ability to collaborate with each other."

Summers also said he is "very proud of Wilson and his efforts so far." Now, he - and the Medical Center - look forward to the future.

"This award has the potential to be transformational for us," Summers said. ■



Dr. Richard Summers and Dr. James Wilson

# Obesity Research News

## Study: weight-loss surgery's impact on children

Women who have weight-loss surgery experience health benefits beyond lower weight, such as lower cholesterol and higher glucose tolerance. However, according to Dr. Bernadette Grayson, assistant professor of neurobiology and anatomical sciences, children born after their mother's surgery could face long-term health consequences, including obesity and diabetes.

"The surgery treats obesity, but some of the post-surgery effects have not been vetted," said Grayson, who presented some of her recent findings during an invited talk at the American Physiological Society conference, "Cardiovascular, Renal and Metabolic Disease: Physiology and Gender," Nov. 19, 2015 in Annapolis, Maryland.



Dr. Bernadette Grayson

Grayson is a neuroscientist who studies metabolic syndrome, a group of diseases including obesity, diabetes and hypertension. In the lab, she uses female rats to study the effects of vertical sleeve gastrectomy (VSG) on reproductive biology. She looks at the long-term health of the offspring born post-surgery.

According to Grayson, changes to the maternal environment post-VSG - particularly in the placenta - may limit the pups' growth and lead to metabolic syndrome later in life.

"I don't know of any other groups who do this type of research," she said.

During VSG, a surgeon removes 75-85 percent of the stomach and reseals it, creating a tube-like sleeve in place of the stomach sac. This initially limits the amount of food a person can eat, so fewer calories are consumed. However, the reason for this long-term weight loss is still not well known.

A typical patient loses more than half of his or her body weight during a three-year period. The procedure usually has few long-term complications.

Dr. Kenneth Vick, professor of surgery, said VSG makes up 85-90 percent of bariatric surgeries performed at the hospital. He said

some women may consider pregnancy 12-18 months after surgery.

"Fertility may actually improve after surgery," Vick said, since obesity is a risk factor for infertility.

Studies show these women to have lower rates of pregnancy-related complications like preeclampsia and gestational diabetes than obese women who haven't had the procedure. This has led some researchers to think VSG also would benefit future children, Grayson said. Children born to obese mothers are more likely to be obese themselves and develop high blood pressure and type 2 diabetes.

During her postdoctoral fellowship at the University of Cincinnati, Grayson tested this idea. What she found was quite different.

According to her 2013 study published in *Science Translational Medicine*, rat pups born to VSG mothers were shorter and lighter than controls, a condition known as intrauterine growth restriction. Pups whose mothers ate high-fat diets after surgery also had high levels of fats and cholesterol in their systems.

Grayson compares this scenario to patients who return to "bad habits" post-surgery, like eating high-fat foods instead of the lower-fat diet physicians recommend after VSG. As adults, these same offspring had more body fat and reduced glucose tolerance, which represent obesity and diabetes in humans.

"We're improving the mom's health, but it's leading to poor outcomes for her offspring," Grayson said. "No one knew about these effects before the research came out."

Grayson and other researchers don't know why the VSG rat offspring are smaller and more likely to develop obesity and diabetes. That's the focus of her current research, which she presented last November.

Grayson showed that the VSG mothers had an abnormal, more permeable placenta. She thinks this is an important clue. With higher permeability, everything can pass from mother to baby more easily, she said. That could include hormones, proteins or microorganisms, but it is too early to know what causes the health problems Grayson sees in her rats.

Vick said Grayson's findings could help improve patient care.

"The more we know, the better we can counsel patients on risks and expectations, which I believe leads to improved outcomes," he said

— Karen Bascom

## COBRE funds new pilot project grants

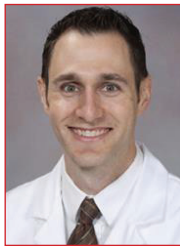
The Centers of Biomedical Research Excellence (COBRE) grant from the National Institutes of General Medical Sciences is a five-year award designed to develop mentoring and education programs, infrastructure, and core facilities that foster excellence in basic, clinical and population research in obesity, cardiorenal and metabolic diseases.

The COBRE currently supports several research core facilities and the research of 10 investigators in six different departments. Last year, three new researchers were awarded COBRE pilot grants to help support their work:

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**Dr. Andrew Smith**, associate professor of radiology, and his team have started a prospective clinical trial to develop and test software that can be used to accurately measure the amount of liver fat on CT images.



Smith

Fat accumulation in the liver is found in 20-30 percent of Americans and is associated with increased risk of liver-related complications, including heart attacks, stroke, cirrhosis and liver failure. Noninvasive methods to measure the amount of fat in the liver and identify those patients at the highest risk of developing liver-related complications are needed.

Computed tomography (CT) imaging is widely available, commonly used to assess the abdomen and liver, and noninvasive. The team has already developed patent-pending technology to measure the amount of liver-surface nodularity on CT images. The liver surface becomes more nodular (bumpy) as fatty liver disease becomes more advanced, and this technology would allow clinical providers to identify those people at the highest risk for developing liver-related complications.

Smith's team is currently evaluating the CT images and medical records of nearly 1,000 patients to validate the liver-surface nodularity software.

**Dr. Fan Fan**, assistant professor of pharmacology and toxicology, is studying the association of vascular cognitive impairment (VCI) and hypertension in elderly patients.



Fan

One in three adults in the United States (about 67 million people) have hypertension; the incidence of hypertension increases up to 70 percent in patients older than 65. Hypertension is associated with a higher incidence of stroke and the loss of cognitive function with aging; however, the mechanisms involved are unclear.

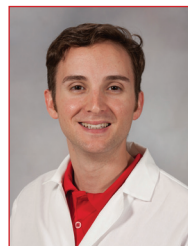
Autoregulation blood flow in the brain is a critical mechanism that protects the brain from increases in blood pressure. Previous studies have indicated that this protection may depend on the formation of a compound called 20-HETE.

Fan's team recently found that a strain of hypertensive rats have a genetic mutation in the formation of 20-HETE. They do not autoregulate cerebral blood flow and develop vascular damage, loss of neurons and learning and memory defects as they age or if their blood pressure increases.

To relate this to humans, Fan's group looked for mutations in the genes that produce 20-HETE in more than 4,000 elderly patients who have been followed for many years. The team

discovered that mutations in the genes producing 20-HETE are associated with the development of stroke and loss of cognitive function in this population.

This is the first study to link a genetic mutation in the formation of 20-HETE to the decline in memory with aging. Fan's group now plans to study the mechanism involved and develop new treatments.



Spradley

**Dr. Frank Spradley**, instructor in surgery and in physiology and biophysics, is interested in examining the mechanisms whereby obesity unexplainably increases the risk for hypertensive disorders of pregnancy. These mechanisms are the number one cause of pregnancy-related deaths in the U.S.

One of these disorders is preeclampsia (PE). Although human studies have consistently shown a positive association between obesity and PE, there are limited studies on the mechanisms involved. Such studies may assist in developing novel treatment strategies to prevent this dangerous disorder; the only current "cure" is early delivery of the baby and placenta.

The incidence of PE is on the rise, calling for studies to examine how the increasing prevalence of risk factors like obesity exaggerate the mechanisms that promote this hypertension.

One potential mechanism in which obesity may increase the risk for developing PE is by enhancing the blood pressure response following reductions in blood flow to the utero-placental unit. This is termed placental ischemia.

Spradley will use a placental ischemic rat model of PE, which is induced surgically by reductions in uterine perfusion pressure (RUPP), leading to widespread activation of the potent vasoconstrictor endothelin (ET)-1 in the maternal vasculature and kidney. This occurs by mechanisms involving placental release of anti-angiogenic factors such as soluble fms-like tyrosine kinase (sFlt-1), which antagonizes vascular endothelial growth factor (VEGF) and placental growth factor (PlGF).

Intriguingly, it has been shown that lower PlGF predicts development of PE better in obese versus normal-weight women. Spradley has preliminary data in an experimental rat model of obesity during pregnancy suggesting that reductions in VEGF and PlGF may be exaggerated as a result of greater sFlt-1 levels in response to placental ischemia/hypoxia. Thus, this research project has the potential to shed light on the mechanisms whereby obesity increases the risk for hypertensive disorders of pregnancy by using preclinical studies to develop novel therapeutic strategies. ■

# Faculty News

Dr. Romain Harmancey, assistant professor of physiology and biophysics, is investigating why diabetic individuals recover less well from a heart attack when compared to non-diabetic patients.

Specifically, Harmancey and his team are studying how insulin resistance, a condition defined by an impairment of the hormone's biological effects, impairs recovery of the heart's pumping action following the restoration of blood supply to cardiac tissue with conventional revascularization methods.

Using rodent models of insulin resistance, the team found that after an interruption in blood flow, the capacity of the insulin-resistant heart to utilize long-chain fatty acids, the most prominent source of fat-derived energy in the body, is decreased. The team also discovered that insulin resistance causes cardiac mitochondria, the energy factories of the cells, to lose one of their components known as uncoupling protein 3 (UCP3).

The investigators are now working with rats that have been genetically engineered so that they are lacking this protein to test whether UCP3 deficiency is responsible for the inability of heart mitochondria to generate energy from long-chain fatty acids after a heart attack. They are also testing whether providing shorter fatty acids as an alternative energy-providing substrate for the heart may help cardiac mitochondria to produce more energy in spite of the loss of this protein, and may therefore improve recovery of the heart's pumping action.

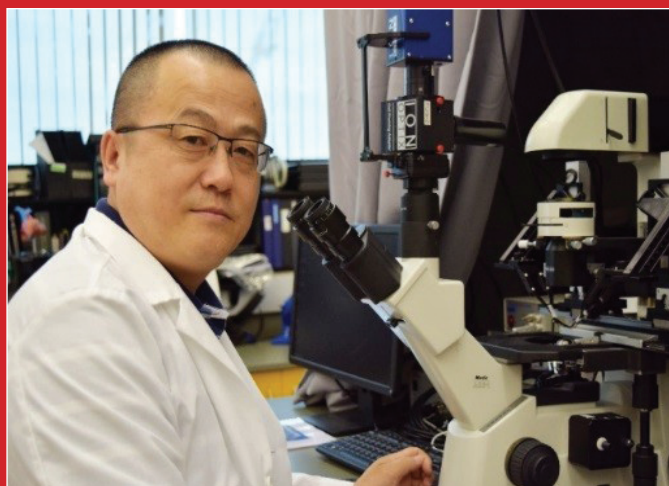
The long-term goal of this project is to reduce the health disparities



Dr. Romain Harmancey with Jessica Wiseman, researcher

existing between diabetic and non-diabetic patients in the face of a heart attack. Diabetes is already affecting 10 percent of the U.S. population, and it is anticipated that one in three Americans will suffer from the disease by the year 2050. Improving the recovery of the pumping function of the heart will benefit diabetic patients by decreasing the time spent in hospitals after being treated for a heart attack and will improve their survival and long-term quality of life.

Harmancey's research is supported by a grant from the National Institutes of Health. ■



Dr. Ji Li

Dr. Ji Li, associate professor of physiology and biophysics, is studying signaling mechanisms for ischemic stress in the cardiovascular system.

In particular, Li and his group are interested in the mechanisms that govern substrate metabolism in response to ischemia and reperfusion stress, with special emphasis on AMP-activated protein kinase (AMPK), a central component of the cellular stress response that shifts metabolism towards ATP restoration during the ischemic condition.

The immediate goal is to explore and validate protective actions of AMPK against cardiac damage during ischemia/reperfusion and pressure overload. The long-term goal is to incorporate and integrate AMPK signaling pathways into realistic pharmacologic targets for developing drugs to not only reduce morbidity, but also decrease mortality of myocardial infarction and heart failure in patients, especially in the elderly.

Li's research is supported by grants from the National Institutes of Health and the American Diabetes Association. ■

# Faculty brings recognition to MCOR discovery achievements



Intapad

Dr. Suttira Intapad, assistant professor of physiology and biophysics, received the Caroline tum Suden/Frances Hellebrandt Professional Award from the American Physiological Society's Women in Physiology Committee and the Kidney Council New Investigator Award from the American Heart Association's Council on Hypertension in 2015.



M. Hall

Dr. Michael Hall, assistant professor of medicine, received the Patrick Lehan Cardiology Faculty of the Year Award at UMMC. Named in honor of the former cardiology division director, the award is chosen by the cardiology fellows and presented to the most outstanding cardiology faculty member.



DeLeon-Pennell

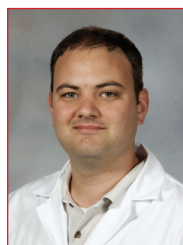


Palei



Warrington

Dr. Kristine DeLeon-Pennell, Dr. Ana Palei and Dr. Junie P. Warrington, instructors in physiology and biophysics, received American Physiological Society Minority Travel Fellow Awards to attend the 2015 Cardiovascular, Renal and Metabolic Diseases: Physiology and Gender Conference in Annapolis, Maryland last November.



George

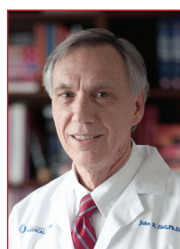
Dr. Eric George, assistant professor of physiology and biophysics, received the 2016 Water and Electrolyte Section New Investigator Award from the American Physiological Society.



Williams

Dr. Jan Williams, associate professor of pharmacology and toxicology, received a Research Recognition Travel Award from the American Physiological Society. The award is presented in recognition of meritorious research by young investigators who participate in the Experimental Biology Meeting.

Dr. John E. Hall, Arthur C. Guyton Professor and Chair of the Department of Physiology and Biophysics and MCOR director, received the American Heart Association's Award of Meritorious Achievement. The award is presented in recognition of significant, long-lasting scholarly



J. Hall

contributions, leadership and mentorship in the field of hypertension.

Hall also received the 2015 Distinguished Service Award from the Association of Chairs of Departments of Physiology (ACDP) and the 2016 Ray G. Dagg's Award from the American Physiological Society. The Dagg's Award is "presented to a physiologist who is judged to have provided distinguished long-term service to the science of physiology and in particular to the American Physiological Society, by holding a prominent position in the society."



Granger

Dr. Joey Granger, Billy S. Guyton Distinguished Professor of Physiology and Biophysics, dean of the School of Graduate Studies in the Health Sciences and director of the Cardiovascular Renal Research Center, was named the 2016 Southeastern Conference Faculty Achievement Award winner representing the University of Mississippi.

Granger is dedicated to training the next generation of biomedical scientists by mentoring graduate students and postdoctoral scholars. He is principal investigator of the Medical Center's NHLBI Institutional Training Grant for hypertension and cardiorenal diseases research.

Granger is the second Medical Center physiology faculty member in three years to win the award: Dr. John Hall was recognized in 2014 and was later named SEC Professor of the Year.

## MCOR investigators receive extramural grants

**Dr. Suttira Intapad**, instructor in physiology and biophysics, received an American Heart Association Scientist Development Grant, "Maternal Preeclampsia Programs Hypertension in Mouse Offspring."

**Dr. Michael E. Hall**, assistant professor of medicine and assistant professor of physiology and biophysics, received an NIH-K08 award, "Renal Sinus Fat, Hypertension and Altered Kidney Function."

**Dr. Junie P. Warrington**, instructor in physiology and biophysics, received an NIH-K99 award grant, "Cerebrovascular Abnormalities in Preeclampsia."

**Dr. Jennifer Sasser**, assistant professor of pharmacology and toxicology, received the American Society of Nephrology's Carl W. Gottschalk Research Scholar Award, "Hypertension in Pregnancy – Mechanisms and Mediators."

**Dr. Bernadette Grayson**, assistant professor of neurobiology and anatomical sciences, received a Military Medical Research and Development grant from the Department of Defense, "Metabolic Disease in a Clinically Relevant Rodent Model of Spinal Cord Injury."

**Dr. Fan Fan**, assistant professor of pharmacology and toxicology, received an American Heart Association Grant-in-Aid award, "Role of 20-HETE on Aging and Hypertension-related Cerebral Vascular Disease."

**Dr. Richard Roman**, professor and chair of pharmacology and toxicology, received a subcontract from the Biocon Medicinal Bioconvergence Research Center for a research agreement.



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## How to help the MCOR achieve its mission

Although UMMC has made a strong commitment to developing and sustaining the MCOR research and prevention effort, external funding is required to fully realize the potential of the Mississippi Center for Obesity Research.

The MCOR program is currently funded mainly from extramural sources, including gifts from generous donors and grants from the National Institutes of Health (NIH). All funds donated to MCOR will help advance obesity research, prevention and treatment.

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