



Physiology News

The UMMC Department of Physiology and Biophysics Newsletter

Issue 4/January 2021



Chair's Welcome

When 2020 began, we could not have imagined the events that would unfold and the challenges that we would all face professionally and personally. We sincerely hope that you and your families are safe and well, and will remain healthy through the crisis brought by COVID-19.

Although the education, research and service missions of our department changed dramatically in March 2020, our faculty and trainees made a remarkably rapid and successful transition to delivering educational instruction and learning via web-based platforms. Our research laboratories rapidly changed operations to ensure safety of lab personnel but most investigators were able to continue their research programs, using appropriate personal protective equipment (PPE) and scheduling to avoid having too many people in the same place at the same time. The UMMC Center for Comparative Research, under the direction of Dr. Andrew Grady, provided PPE and maintained operations of the laboratory animal facilities despite many challenges. Like many academic health science centers with major hospitals, UMMC was forced to make difficult financial decisions and implement mitigation plans that resulted in large reductions of our department budget, which we hope will be temporary.

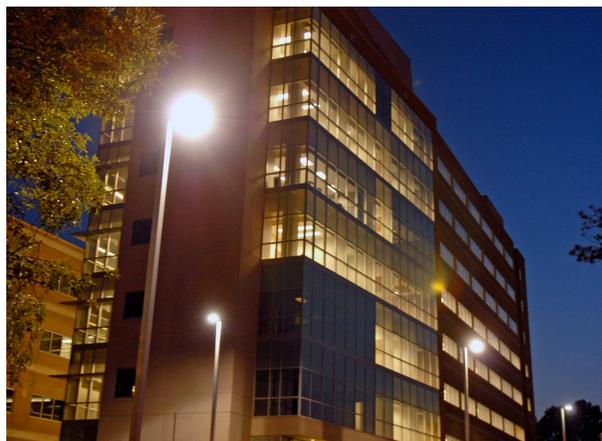
Despite these challenges brought by the COVID-19 crisis, the Department of Physiology and Biophysics had many successes during 2020. Our education programs continue to receive high ratings, our graduate students and fellows continue to receive many awards, our faculty continue to publish important discoveries in top journals and receive highly competitive extramural research funding, and our faculty and staff continue to provide outstanding service and leadership for professional organizations and for UMMC. I am delighted that we remain as one of the top physiology departments in the country through outstanding research, education and service contributions.

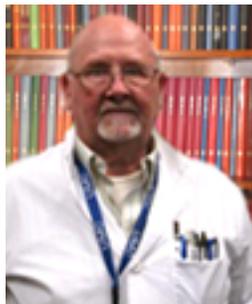
We hope that the brief summary in this newsletter of the extraordinary activities and productivity of our faculty, fellows, students, and staff this past year provides useful information as well as a welcome respite. It is a great privilege to work with such talented, resilient, and dedicated colleagues who continue to make us proud to be part of the Department of Physiology and Biophysics at the University of Mississippi Medical Center.

With best wishes for a happy, healthy and productive new year,

A handwritten signature in cursive script that reads 'John E. Hall'.

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





In Memoriam: Jan Loflin

Mr. Jan Harrison Loflin passed away on November 7, 2020. He was 84.

Jan was born July 2, 1936 and raised in Star, MS. He proudly served in the U.S. Air Force and in 1965 joined UMMC and the Department of Physiology and Biophysics. During his nearly 55 year tenure in the department, Jan served as a research assistant and managed the department machine shop for many years. Jan "retired" on June 30, 1998 but continued to work part time, serving as a valued colleague and a tremendous source of expertise for the department until February 2020.

Jan was a talented woodworker, machinist, "plastics engineer", and all around "fix it" expert who could repair almost anything. He knew where

Haiyan Zhang retires from the Physiology Department

Ms. Haiyan Zhang retired at the end of June 2020 after serving as the Laboratory Manager of the Analytical and Assay Core for the Department of Physiology and Biophysics for over 28 years.

During her years of service, she served as an outstanding resource for the departmental NIH funded Program Project grant, the NIH funded Cardiorenal and Metabolic Disease Research COBRE, numerous R01s for departmental and other institutional users, and numerous other investigators at all levels of their career.

all of the old equipment was stored and could always find what was needed by department researchers and staff. Jan also had a keen memory and was a rich source of knowledge of department history. He was highly respected and admired by his colleagues.

Jan was a devoted husband to Cora Quimby Loflin, his wife of 61 years, who preceded him in death. Jan and Cora traveled around the world and had many adventures together. He enjoyed exploring new places. He was a loving father, grandfather, and great grandfather. Jan is survived by his daughter Pamela and her husband Major William Baker, USMC (Ret.), of King, NC; grandson Harrison Baker of Greenville, SC; granddaughter Kimberly and her husband Captain Kane Jones, USAF, of Biloxi; great granddaughter Shelby Jones of Biloxi; and sister Patsy Phillips of Star.

An outside visitation was held at Wesleyanna United Methodist Church in Star on November 20th. Memorials may be made to the Childrens of Mississippi at UMMC.



She exemplified the true spirit of a team player and she always provided assistance with a friendly smile and gracious attitude.

In November 2018, she was awarded the Meritorious Research Service Award for a Staff Member at the annual UMMC Research Excellence Awards Day recognizing her outstanding service to the research mission of the Department of Physiology and the institution.

The Department of Physiology & Biophysics has ranked in the top 10 (ranging from 4th to 10th) physiology departments in the country for total research funding from the National Institutes of Health (NIH) for the past several years. These high rankings for NIH funding have occurred despite the considerably fewer faculty members in our department, compared to others ranked in the top 10.

New Extramural Research Funding

- Dr. Barbara Alexander, NIH-R01, "Hypertension in adult IUGR offspring: beneficial effects of perinatal intervention"
- Dr. John Clemmer, NIH-K99, "Improving hypertension treatment in African Americans"
- Dr. John Clemmer, Joey and Dorothy Dorsett Brown Foundation Grant, "Developing a computational model that mimics the physiological changes associated with ageing and its impact on cardiovascular disease"
- Dr. Jussara do Carmo, NIH-R01 grant, "Long-term consequences of parental obesity on developmental programming of cardiorenal disease in offspring"
- Dr. Robert Hester, Hearin Foundation Grant, "Sycamore: a real-time simulation for continuity of care training"
- Osvaldo Gonzalez Rivera, graduate student, received a NIH-F31, "Endothelin in obesity-induced insulin resistance"
- Dr. Joey Granger, renewal of NIH-T32, "Hypertension and cardiorenal disease research training program"
- Dr. Michael Ryan, renewal of NIH-R25 grant, "Mississippi diversity in hypertension and cardiorenal research program"
- Dr. David Stec, NIH-R01, "Integrative role of bilirubin in obesity"
- Dr. Erin Taylor, NIH-K99, "Immune system dysfunction and gut dysbiosis in the pathogenesis of vascular dysfunction in autoimmunity"

Ongoing Extramural Research Funding

- Dr. Barbara Alexander, NIH-R01, "Hypertension in adult IUGR offspring: beneficial effects of perinatal intervention"
- Dr. Alejandro Chade, NIH-R01, "Microcirculation in renovascular hypertension"
- Dr. Yingjie Chen, NIH-R01, "Mechanisms of treg and IL-35 regulating LV failure-induced lung remodeling and right heart hypertrophy"
- Dr. John Clemmer, NIH-K99, "Improving hypertension treatment in African Americans"

- Dr. John Clemmer, Joey and Dorothy Dorsett Brown Foundation Grant, "Developing a computational model that mimics the physiological changes associated with ageing and it's impact on cardiovascular disease"
- Elena Dent, graduate student, AHA Postdoctoral Fellowship, "Renal hemodynamic mechanisms of hypertension during autoimmunity"
- Dr. Jussara do Carmo, NIH-R01 grant, "Long-term consequences of parental obesity on developmental programming of cardiorenal disease in offspring"
- Dr. Eric George, NIH-R01 grant, "A novel therapy for preeclampsia"
- Osvaldo Gonzalez Rivera, graduate student, received a NIH-F31, "Endothelin in obesity-induced insulin resistance"
- Dr. Joey Granger, NIH-U54, "Mississippi Center for Clinical and Translational Research"
- Dr. Joey Granger, renewal of NIH-T32, "Hypertension and Cardiorenal Disease Research Training Program"
- Dr. John Hall, NIH-P20-COBRE, "Cardiorenal and Metabolic Diseases Research Center"
- Dr. Romain Harmancey, NIH-R01, "Molecular basis of postischemic maladaptation in the insulin resistant heart"
- Dr. Robert Hester, Hearin Foundation Grant, "Sycamore: a real-time simulation for continuity of care training"
- Dr. Michael Ryan, renewal of NIH-R25 grant, "Mississippi Diversity in Hypertension and Cardiorenal Research Program"
- Dr. Michael Ryan, Dr. Joey Granger, Dr. Heather Drummond, NIH-R01, "Placental ischemia, hypertension and vascular function"
- Dr. Joshua Speed, NIH-R00, "Endothelin-mechanisms in hypertension and obesity"
- Dr. David Stec, NIH-R01, "Integrative role of bilirubin in obesity"
- Dr. Erin Taylor, NIH-K99, "Immune system dysfunction and gut dysbiosis in the pathogenesis of vascular dysfunction in autoimmunity"
- Dr. Zhen Wang, NIH-R00, "Mechanisms of synergistic interactions of hypertension and diabetes in promotion kidney injury"



Service Milestones



Dr. Joey Granger has given 30 years of distinguished service to the University of Mississippi Medical Center. Dr. Granger is Dean of the School of Graduate Studies in the Health Sciences. He is also professor of Physiology and Medicine, Director of the Cardiovascular-Renal Research Center, Director of the Mississippi Center for Clinical and Translational Research and a Billy S. Guyton Distinguished Professor.



Dr. Robert Hester has given 35 years of outstanding service to the University of Mississippi Medical Center. Dr. Hester is the Interim Chair of the Department of Data Science and the Director of the Center for Computational Medicine. He is professor of Physiology and Orthopedic Surgery and a Billy S. Guyton Distinguished Professor.



Catherine Kaime has given 15 years of service, and is the project manager for the Cardiorenal and Metabolic Diseases Research Center and the Mississippi Center for Obesity Research.



Honors, Awards, and Recognitions

Laura Coats, graduate student, received the Caroline tum Suden Frances Hellebrandt Professional Opportunity Award at Experimental Biology in April 2020.

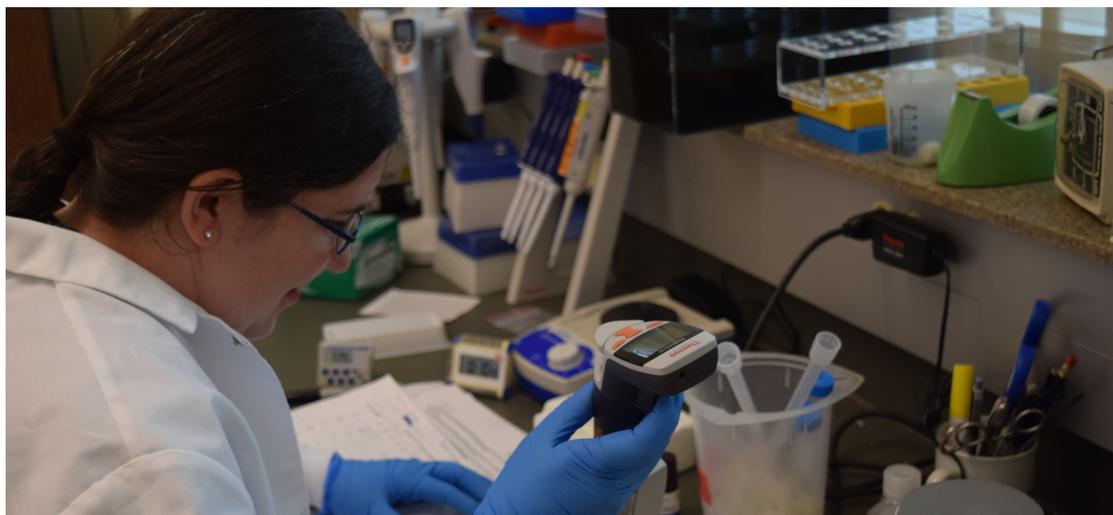


Jason Engel, MD/PhD student, received the School of Graduate Studies Regions Outstanding Research Award at the UMMC School of Graduate Studies Honors Day in April 2020.

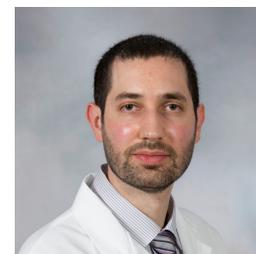
Tyler Lomax, PhD student, received the Martin Frank Diversity Travel Award from the American Physiological Society and was named a 2020 CaMPS Robert Gunn Award Finalist at the Experimental Biology Meeting in April 2020.



Dr. Alan Mouton, Instructor, received the Cardiovascular Section Research Recognition Award at Experimental Biology in April 2020. He also received the Trustmark Postdoctoral Fellow Award at the UMMC School of Graduate Studies Honors Day in April.



[Dr. Romain Harmancey](#), promoted to associate professor



[Dr. Eric George](#), granted tenure

Excellence in Research Awardees

The University of Mississippi Medical Center recognized the following faculty in the Department of Physiology and Biophysics during the 2020 Excellence in Research Awards.

The medallions are based on the cumulative amount of extramural funding received for an investigator's original research.

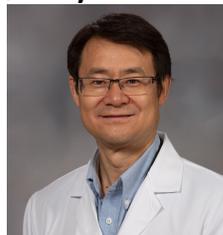
UMMC received near-record levels of funding and the most individual grants and awards in its history in fiscal year 2020, despite the challenges of the past several months.

Platinum Medallion \$5,000,000 total



[Dr. Michael Ryan](#),
professor of physiology
and biophysics

Silver Medallion \$500,000 total

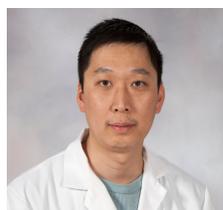


[Dr. Yingjie Chen](#),
professor of physiology
and biophysics

Bronze Medallion \$250,000 total



[Dr. Erin Taylor](#),
instructor in physiology
and biophysics



[Dr. Zhen Wang](#), assistant
professor of physiology and
biophysics

Welcome New Faculty, Postdoctoral Fellows, Graduate Students, Research Assistants



[Dr. Thales Barbosa](#), instructor



[Usman Ashraf](#), postdoctoral fellow, lab of Dr. Barbara Alexander



[Brigitte Martin](#), postdoctoral fellow, lab of Dr. Michael Ryan



[Ana Omoto](#), postdoctoral fellow, lab of Dr. John Hall



[Umesh Bhattarai](#), graduate student



[Madison Newberry](#), graduate student

New Research Assistants



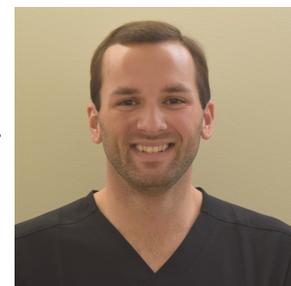
Nikaela Aitken,
researcher II, lab of
Dr. John Hall

Drew Bossier,
researcher II, lab of
Dr. Alejandro Chade



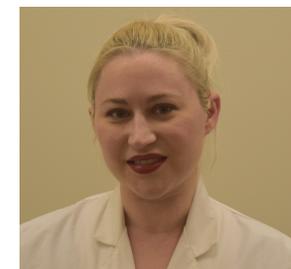
Phillip Burrow,
researcher II, lab of
Dr. David Stec

Tanner Case,
researcher II, lab of
Dr. Erin Taylor



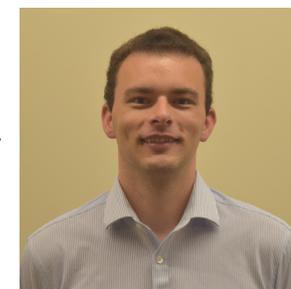
Dee Fortenberry,
researcher II, lab of
Dr. Alejandro Chade

Kat Johnson,
researcher II, lab of
Dr. Eric George



Hayley Murphy,
researcher II, lab of
Dr. Eric George

Jaylan Sears,
researcher II, lab of
Dr. Zhen Wang



Research Highlights



Dr. Erin Taylor,
Instructor

Autoimmune disease is an important health problem that affects approximately 24 million Americans. Patients with autoimmune diseases such as systemic lupus erythematosus (SLE) and rheumatoid arthritis have an increased risk of developing premature cardiovascular disease CVD, which is a chief contributor to mortality in these patients. Dr. Taylor's research is focused on understanding the immune-mediated mechanisms that contribute to the development of hypertension and vascular dysfunction in autoimmunity, utilizing rodent models of SLE.

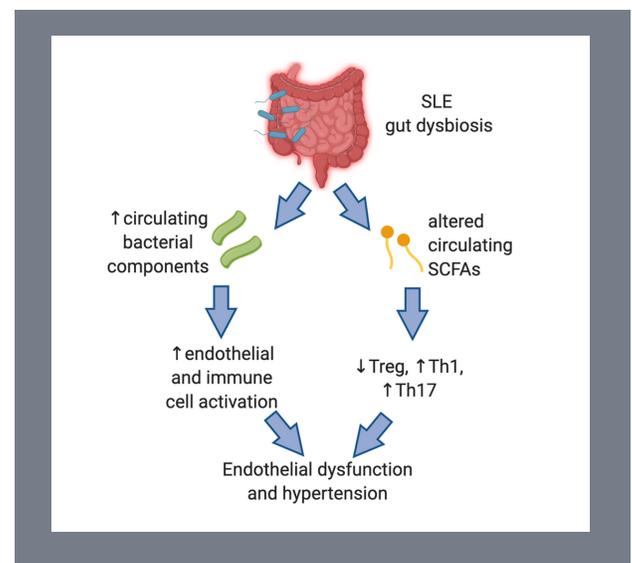
One area of current research involves examining the link gut dysbiosis and the development of hypertension and vascular dysfunction in autoimmunity. Recent studies have implicated gut dysbiosis, a condition of altered microbiota composition, in the pathogenesis of SLE.

While it is increasingly recognized that the gut microbiome is an important physiological and immunological regulator, a precise mechanistic role of gut dysbiosis in hypertension and vascular dysfunction is unknown. Dr. Taylor's laboratory is currently testing the role of circulating bacterial cell wall components and microbial short chain fatty acids (SCFAs) in the development of hypertension and endothelial dysfunction in SLE.

A second area of research is focused on the role of leptin in the development of autoimmune-associated hypertension. Leptin is primarily produced by white adipose tissue and has a prominent role in regulating appetite and energy expenditure. Leptin also has various immunomodulatory properties, including promoting the expansion of proinflammatory T cells as well as the proliferation and survival of B cells. Patients with SLE have elevated plasma levels of the adipokine leptin compared to age-matched controls, independent of BMI, suggesting that leptin may play a role in disease pathogenesis. Current studies involve the chronic administration of a leptin antagonist to mice with SLE, as well as assessing the relative roles of central and peripheral leptin signaling in the development of autoimmunity.

For more information please click on the link below:

<https://pubmed.ncbi.nlm.nih.gov/30892934/>



For more information on Dr. Taylor's research, please click on the link:

[https://www.umc.edu/som/Departments and Offices/SOM Departments/Physiology/About-Us/Faculty-and-Staff/Taylor- Overview.html](https://www.umc.edu/som/Departments%20and%20Offices/SOM%20Departments/Physiology/About-Us/Faculty-and-Staff/Taylor-Overview.html)

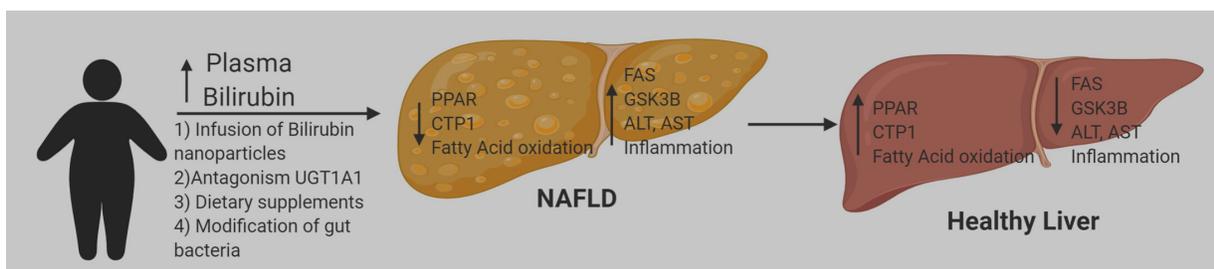
Research Highlight



Dr. David Stec,
Professor

Nonalcoholic Fatty Liver Disease (NAFLD) is a common liver disease associated with obesity. NAFLD is the leading cause of liver disease, and there are currently no drugs approved to treat this condition. Human population studies have identified that plasma bilirubin levels are inversely correlated with NAFLD development. Studies in obese humans and animals have also demonstrated that plasma bilirubin levels are lowered by obesity.

Dr. Stec's lab has recently shown that treatment with bilirubin activates proteins associated with fat burning in the liver, thereby reducing NAFLD. The goals of Dr. Stec's lab are to develop new ways to increase plasma bilirubin in obese individuals in order to reverse NAFLD. Dr. Stec's lab is also studying the mechanism by which bilirubin increases fat burning in the liver in order to develop new therapies for the treatment of NAFLD.



For more information please click on the links below:

<https://pubmed.ncbi.nlm.nih.gov/33390979/>

<https://pubmed.ncbi.nlm.nih.gov/33284088/>

For more information on Dr. Stec's lab, please click on the link:

[https://www.umc.edu/som/Departments and Offices/SOM Departments/Physiology/About-Us/Faculty-and-Staff/David_Stec_.html](https://www.umc.edu/som/Departments_and Offices/SOM Departments/Physiology/About-Us/Faculty-and-Staff/David_Stec_.html)

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