

Office of Research  
Center for Brain Health  
Center of Excellence for Arthritis and Rheumatology  
Center for Cardiovascular Diseases and Sciences  
Feist-Weiller Cancer Center of Excellence

# Inside: RESEARCH

Summer 2019

**LSU Health**  
SHREVEPORT

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Faculty, staff and students at LSU Health Shreveport are actively engaged in research in a variety of biomedical areas, with concentrations in cancer, cardiovascular sciences, virology and neuroscience. A core part of the institution's mission, research on campus ranges from basic science to translational research and testing the latest therapies in clinical trials. The School of Graduate Studies helps to train future scientists, and our five centers, three of which are Centers of Excellence, further elevate the research portfolio.

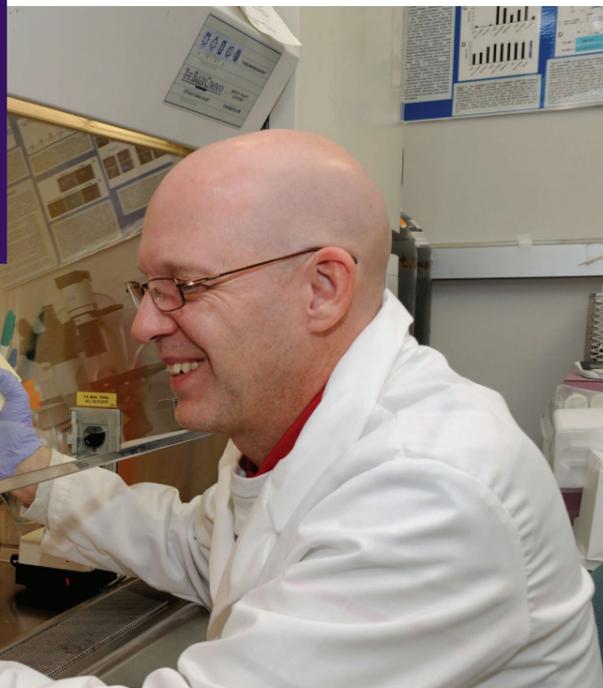
The Office of the Vice Chancellor for Research supports these endeavors and is comprised of the Office for Sponsored Programs and Technology Transfer, Research Development and Management, Human Research Protections Program (HRPP), the Institutional Review Board (IRB), and the Research Core Facility.

*Inside Research* is a publication from the Office of the Vice Chancellor for Research at LSUHS.

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# From the Vice Chancellor for Research



**Chris Kevil, PhD**

Vice Chancellor for Research  
 Dean, School of Graduate Studies  
 Director/Principal Investigator, Center for Redox Biology and Cardiovascular Disease COBRE

LSU Health Shreveport's research resurgence continues to move forward and our list of achievements this year continues to grow. Total grant funding awarded to our faculty members in the past year totals more than \$14 million. Our Tech Transfer Office is also thriving with nine patents filed, three patents issued and more than \$1.3 million in licensing income received.

The Louisiana Board of Regents meeting recently unanimously approved the promotion of the Center for Cardiovascular Diseases and Sciences (CCDS) as a Center of Excellence of research and innovation. The Board of Regents, along with the LSU and University of Louisiana System Board of Supervisors also gave their recent approval to establish the Center for Tissue Engineering and Regenerative Medicine (CTERM). The CTERM will be a collaborative research endeavor between LSU Health Shreveport and Louisiana Tech University that is the first of its kind in the state. The **C**ardiovascular **U**ndergraduate **R**esearch **I**nitiative **f**or **U**nderrepresented **S**tudents (CURIUS) Program is underway on campus. This summer research program is funded by the NIH to support underrepresented undergraduate students interested in pursuing research as a part of their career aspirations.

The research component of our partnership with Ochsner Health System also continues to move forward. We recently submitted joint institutional grants to the Louisiana Clinical & Translational Science Center, our inter-institutional Confidentiality and Non-disclosure Agreements are complete, and our teams are working on agreements that will enable data sharing to continue research collaboration. Additional collaborative research projects are already underway through co-hosting research retreats and a webinar series between LSUHS and OHS.

The future of research at LSU Health Shreveport continues to be bright. I look forward to sharing updates on our research initiatives, including the CTERM, the CURIUS Program, high school student research programs, and many others as they evolve.

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# INAUGURAL RESEARCH CELEBRATION

## LSU HEALTH SHREVEPORT CELEBRATES GROWTH & ACCOMPLISHMENTS IN RESEARCH

At LSU Health Shreveport, the next generation of doctors and scientists are being trained and important discoveries are being made that will impact how diseases are treated or cured in the future. Leadership, faculty, staff and students celebrated the growth and accomplishments of research initiatives and funding at LSU Health Shreveport at the inaugural Research Celebration event held on Feb. 28.

### By The Numbers (FY18-19):

- Federal, state & private grants were up by **47%** in 2018 over 2017
- Total grant funding for 2018 was **\$14,814,174**
- More than **\$1.3 million** received in licensing revenue received
- **353** active clinical studies taking place on campus
- More than **100** extramural grant submissions
- **Five** start-up companies created to license and commercialize LSUHS technologies
- **Nine** USPTO Patent Notices of allowance for LSUHS technologies
- **34** pharma studies sponsored by a pharmaceutical company

Faculty members who have excelled in various areas of research were also honored at the event.



**Dr. A. Wayne Orr**, Director of the Center for Cardiovascular Diseases and Sciences, received the Excellence in Extramural Funding award for having three concurrent R01 grants from the National Institutes of Health that support his cardiovascular disease research efforts.

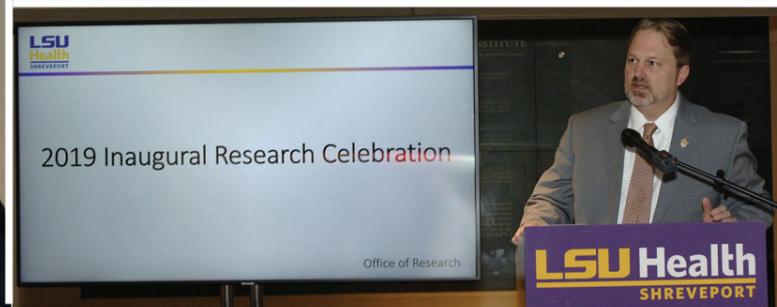


**Dr. Glenn Mills**, Director of Medical Service at Feist-Weiller Cancer Center, received the Excellence in Translational Research award for his contributions to cancer treatment and research.



**Dr. Robert Rhoads**, Emeritus Professor and former Chair of the Department of Biochemistry and Molecular Biology, received the Excellence in Innovation award for his numerous patents made possible by discoveries in his lab.

Also highlighted at the event were exciting things coming up in the near future for the Office of Research, including the pending COBRE Center for Immunology, Inflammation and Infectious Disease (CI3D) led by Principle Investigator Dr. Andrew Yurochko, the Cardiovascular Undergraduate Research Initiative for Underrepresented Students (CURIOUS) Program, an NIH-funded summer research program for under-represented minority undergraduate students interested in pursuing research as part of their scientific or clinical career goals led by Principle Investigator Dr. Karen Stokes, and research collaborations with Ochsner Health System, including a joint \$10 million Department of Defense grant submitted on organ health and transplantation.



# HONORS & ACCOLADES

## HARRIS NAMED CHAIRMAN OF DEPARTMENT OF MOLECULAR AND CELLULAR PHYSIOLOGY



**Norman Harris, PhD**, has been named Chairman of the Department of Molecular and Cellular Physiology in the School of Graduate Studies. Dr. Harris was a Research Assistant Professor at LSU Health Shreveport from 1995-1998 before joining the faculty at Pennsylvania State University for six years. He returned to Shreveport in 2004 as an Associate Professor of Molecular and Cellular Physiology. He was promoted to a Full Professor in 2009, and then went on to serve as Vice Chair of the department in 2016. Dr. Harris completed his undergraduate degree in chemical engineering at the Tennessee Technological University and received his graduate degree and PhD in Biomedical Engineering from Vanderbilt University before completing his postdoctoral degree in Physiology at LSU Health Shreveport. For 23 consecutive years (1996-2019), Dr. Harris has been the Principal Investigator of external funding awards. He has received research awards from the National Institutes of Health, National Science Foundation, American Heart Association, Juvenile Diabetes Research Foundation, National Aeronautics and Space Administration (NASA), Crohn's and Colitis Foundation of America, and LSU Health Shreveport's Center for Cardiovascular Diseases & Sciences. Dr. Harris is currently the PI of a \$1.8 million National Institutes of Health R01 grant, "Loss of the retinal glycocalyx in diabetes," and serves as a senior mentor with the NIH's COBRE Center for Redox Biology and Cardiovascular Disease at LSU Health Shreveport.

## SAPP NAMED CHAIRMAN OF THE DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY



**Martin Sapp, PhD**, has been named Chairman of the Department of Microbiology and Immunology at LSU Health Shreveport. Dr. Sapp joined the LSU Health Shreveport faculty in 2005 as an Associate Professor and became a Professor in 2011. He earned a Master's and Doctorate degree in Biology from the Universität Konstanz, Germany and a Habilitation in Medical Microbiology. Dr. Sapp served as a postdoctoral fellow in the laboratory of Dr. A. Worcel at the University of Rochester and in the lab of Dr. R. Knippers at the Universität Konstanz, Germany, during which time he completed his thesis work. He also completed a postdoctoral fellowship at the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) in Germany. Dr. Sapp is a member of the American and German Society for Virology, American Society for Microbiology, and the Editorial Board of *Virology and Virus Research*. His current research focus on the immediate early events of the human papillomavirus life cycle is funded by a National Institutes of Health/National Cancer Institute R01 grant.

## SCOTT APPOINTED AS ENDOWED PROFESSOR

**Rona S. Scott, PhD**, has been appointed the Mingyu Ding Memorial Endowed Professorship in Microbiology. This is the only Basic Science Endowed Professorship. Dr. Scott has direct ties to Dr. Mingyu Ding, who she trained as an incoming graduate student and mentored him while still working in Dr. Sixbey's laboratory.



Dr. Scott is a leader in the study of epigenetic imprints by transient infection with the DNA tumor virus EBV. She is nationally and internationally well-recognized and, as a consequence, is well-funded by extramural grants. She is the Director of the Genomics Core, which is housed in the Research Core Facility as a part of the NIH-funded Center for Molecular and Tumor Virology. She has been instrumental in establishing this core facility and the associated data processing and analysis. Dr. Scott has provided ample service to the research community by serving as reviewer for manuscripts submitted to high impact scientific journals and by serving as reviewer on a NIH Special Emphasis Panel. She has mentored many graduate students as primary mentor. She is currently directing an active laboratory with two postdoctoral fellows and one doctoral student and is part of a team putting together a collaborative COBRE grant application.

## McMARTIN RECEIVES AMERICAN ACADEMY OF CLINICAL TOXICOLOGY DISTINGUISHED SERVICE AWARD



**Kenneth E. McMartin, PhD**, Professor of Pharmacology, Toxicology and Neuroscience, received the American Academy of Clinical Toxicology (AACT) Distinguished Service Award at the North American Congress of Clinical Toxicology (NACCT) meeting in Chicago. This award recognizes Dr. McMartin as an individual who has performed outstanding and dedicated work on behalf of the AACT and the field of clinical toxicology. Past recipients represent the leaders in the field of toxicology and have helped shape AACT to where it is today. Specific recognition was given to Dr. McMartin for his service on the AACT Board of Trustees from 2010-16 and as Chair

of the AACT Research Awards Committee from 2010 to now. He has also served as a member of the AACT Scientific Research Committee and the Multi-Center Research Study Review Committee. He has been the AACT member of the Senior Editorial Board of the journal *Clinical Toxicology* since 2012. At NACCT, he received the Best Scientific Paper Award in 1998 and the Informa Outstanding Innovation Award (Best Presentation) in 2011. His research efforts have emphasized the clinical aspects of toxicology, especially his work that led to the discovery and development of fomepizole, which is now the standard of care antidote for the treatment of methanol and ethylene glycol poisonings. His current research aims to determine the mechanism of toxicity of diglycolic acid, the toxic metabolite of diethylene glycol (DEG), with a goal of finding treatments for these difficult-to-treat DEG poisonings. For such research, he received the Kenneth Morgareidge Award in Toxicology from the International Life Sciences Institute in 1988 and the Translational Impact Award from the Society of Toxicology in 2010. He is currently chair of the Board of Scientific Counselors of the National Toxicology Program of NIEHS.

## BODILY AWARDED AMERICAN SOCIETY FOR MICROBIOLOGY LECTURESHIP

**Jason Bodily, PhD**, Assistant Professor of Microbiology and Immunology, recently received the Charles C. Randall Lectureship from the South Central Branch of the American Society for Microbiology. The Charles C. Randall Lectureship was established by the South Central Branch and awarded annually to an "outstanding young faculty member" who will present a lecture on his or her research at the annual branch meeting. A panel of senior faculty members appointed by the Branch President selects the recipient. The award includes travel expenses to the branch meeting, a plaque, and an honorarium.



Dr. Bodily is the seventh LSU Health Shreveport faculty member to receive this esteemed award. The lectureship award honors Charles C. Randall, former Chairman of the Department of Microbiology at the University of Mississippi Medical Center and former President of the ASM South Central Branch, who made enormous contributions to the growth and development of the microbiological sciences within the South Central Branch, which includes the states of Arkansas, Louisiana and Mississippi.

## Students Present Projects During Research Days

### Graduate Research Day

Students and post-doctoral fellows shared their research during the annual Graduate Research Day on April 26 hosted by the School of Graduate Studies and coordinated by the Graduate Student Council. The day consisted of student talks and presentations, a poster session, and a Keynote Address. The Keynote Speaker was Randal K. Buddington, PhD, from the University of Tennessee Health Science Center who presented “Improving NICU Protocols and Outcomes: The Preterm Pig as a Transformational Model.” The day ended with a fun crawfish boil for students, post-docs, and faculty.

Congratulations to the following Graduate Research Day winners:

#### Junior Division Poster Competition:

- 1st place: Tyler Reekes - Pharmacology, Toxicology & Neuroscience
- 2nd place: Bhattarai Susmita - Cellular Biology & Anatomy

#### Senior Division Poster Competition:

- 1st place: Hemangini Dhaibar - Cellular Biology & Anatomy
- 2nd place: Linda Rubio - Biochemistry & Molecular Biology

#### Talks:

- 1st place: Samantha Murphy - Microbiology & Immunology
- 2nd place: Madison El-Saadi - Pharmacology, Toxicology & Neuroscience

### Medical Student Research Symposium

The 3<sup>rd</sup> Annual Medical Student Research Symposium on April 25 offered medical students a chance to present their research work across various fields. The topics covered four areas: Quality Improvement and Medical Education, Basic Science Research, Clinical Research, and Case Reports. A Platform Presentation session was also added this year. The Research Symposium was sponsored by the Department of Emergency Medicine, Department of Pediatrics, Shreveport Medical Society and Feist-Weiller Cancer Center.

Congratulations to the following medical students who were category winners at the Medical Student Research Symposium, who each received a cash prize and a certificate of achievement:

- **Medical Education/Quality Improvement:** Grant Pearson, MSII
- **Case Reports:** Blake Boudreaux, MSIII
- **Basic Science Research:** Kaitlin Crane, MSIII
- **Clinical Research:** Lindsay Herndon, MSIII
- **Platform Presentations:** James Robinson, MSII

*Special thank you to all of the participants who showcased their research, and the presentation and poster judges!*

## HONORS & ACCOLADES (CONTINUED)

**Andrew Yurochko, PhD**, Professor and Carroll Feist Endowed Chair of Viral Oncology, was named Vice Chairman of the Department of Microbiology and Immunology, and is serving as a Co-PI on a recently awarded Program Project Grant from the National Institutes of Health focusing on how HCMV affects signaling pathways in infected hematopoietic progenitor cells.

**Joseph T. (Tod) Guidry, PhD**, a recent Microbiology and Immunology graduate, has been awarded a Science Policy Fellowship by the American Association of Cancer Research (AACR). This is the first time that the AACR has awarded such a fellowship. Dr. Guidry will rotate through AACR’s Office of Science Policy & Governmental Affairs, Congressional offices, NCI, FDA and possibly the AACR headquarters in Philadelphia. Some of his duties will include analyzing policies of importance to the cancer research community and summarizing them for various audiences, drafting policy position statements, and writing articles for the public.

**Aimee Vozenilek, PhD**, also a recent Microbiology and Immunology graduate, has been named an ORISE (Oak Ridge Institute for Science and Education) Fellow at the FDA, where she will work on projects to improve bacterial polysaccharide vaccines for use in children.

**Saranya Rajendran, PhD**, Postdoctoral Fellow in the Department of Pathology, was named a Young Investigator Award Winner at the Society for Redox Biology and Medicine’s 25<sup>th</sup> Annual Conference.

**Mansoureh Barzegar, MS**, Molecular and Cellular Physiology Graduate Student, won the Bill Halpern Travel Award from The Microcirculatory Society, Inc., which is their highest student submission award.

**Matt Hefner, MD**, PGY5 Neurosurgery Resident, was awarded the Dean Echols Award for the best basic science presentation at the Louisiana Neurosurgical Society (LANS) Annual Meeting for his presentation, “Preliminary Observations of a Murine Mesial Temporal Lobe Epilepsy Model using Kainic Acid.”

**Marlyn Langford, PhD**, Director of Ophthalmology Research, was awarded the honor of Silver Fellow by the Association for Research in Vision and Ophthalmology (ARVO) in their 2019 Fellows Class.

**Reggie Lee, PhD**, Postdoctoral Research Associate in the Department of Neurology, received an American Heart Association Career Development award of \$231,000 for his three-year project, “Serum/glucocorticoid-regulated kinases 1 in cerebral ischemia.”

**Alok Khandelwal, PhD**, Assistant Professor of Research, Otolaryngology / Head and Neck Surgery, was awarded the American Head and Neck Society’s Pilot Grant for his work on “CXCL-17 in cutaneous SCC.”

**Shile Huang, PhD**, Associate Professor of Biochemistry was awarded a pilot grant for \$30,000 from the Botanical Dietary Supplements Research Center for his proposal, “Role of PHLPP and PP2A in the anti-diabetic activity of Artemisia extracts.”

**Jeremy Kamil, PhD**, Associate Professor of Microbiology and Immunology, is Co-PI on a recently awarded five-year, multi-PI R01 grant from the National Institute of Allergy and Infectious Diseases to investigate the molecular switch that governs HCMV reactivation from latency.

**Martin Sapp, PhD**, Chair of Microbiology and Immunology, was selected to be a member of the NIH’s Center for Scientific Review Virology-A Study Section. Dr. Sapp will be a member of the study section through June 2023.

**Chris Kevil, PhD**, Vice Chancellor for Research and School of Graduate Studies Dean, was named a charter member of the NIH Center for Scientific Review’s Atherosclerosis and Inflammation of the Cardiovascular (AICS) System Study Section.

# PIVOTAL CLINICAL TRIAL STUDYING TREATMENT OF COPD TAKING PLACE IN SHREVEPORT

LSU Health Shreveport physicians are currently leading the VENT-AVOID Trial at Ochsner LSU Health Shreveport Academic Medical Center. The VENT-AVOID Trial is a pivotal clinical trial sponsored by ALung Technologies (Pittsburgh, Pa.) that is the world's first trial of extracorporeal carbon dioxide removal (ECCO<sub>2</sub>R) for treating patients with COPD exacerbations. Ochsner LSU Health Shreveport is the only VENT-AVOID Trial site in Louisiana, and is one of 31 trial locations in the United States. The Principal Investigator for the site is Dr. Keith Scott, Professor of Medicine, Pediatrics, and Anesthesiology, and Chief of the Section of Pediatric Pulmonary Medicine, at LSU Health Shreveport.

The VENT-AVOID Trial is a prospective, multi-center, randomized, controlled, two-arm trial of the Hemolung Respiratory Assist System (Hemolung RAS), an investigational medical device that provides low-flow extracorporeal CO<sub>2</sub> removal, or ECCO<sub>2</sub>R, for the treatment of adults with acute hypercapnic respiratory failure due to a severe exacerbation of chronic obstructive pulmonary disease (COPD). The VENT-AVOID Trial is a landmark trial of ECCO<sub>2</sub>R for treating patients with COPD exacerbations. The Hemolung RAS is a dialysis-like device that provides extracorporeal lung support using a 15.5 French central venous catheter for patients experiencing acute hypercapnic respiratory failure. The VENT-AVOID Trial will evaluate the safety and efficacy of the Hemolung RAS in providing ECCO<sub>2</sub>R as an alternative or supplement to invasive mechanical ventilation for patients experiencing severe COPD exacerbations. The trial is being conducted under an Investigational Device Exemption (IDE) from the U.S. Food and Drug Administration.

Eligible patients will be randomized to one of two treatment arms. Patients in the first treatment arm (the Investigational Arm) will receive lung support with the Hemolung RAS plus standard-of-care mechanical ventilation. Patients in the second treatment arm (the Control Arm) will receive standard-of-care mechanical ventilation alone. The primary outcome measure for the trial is the number of ventilator-free days measured from the time the patient is randomized to a treatment arm through 60 days post-randomization.

ALung recently announced that a major milestone has been reached in the U.S. based VENT-AVOID clinical trial. Following its first scheduled review of safety data from the initial 31 subjects enrolled, the independent Data and Safety Monitoring Board (DSMB) of the VENT-AVOID trial recommended continuation of the trial without modification.

According to the American Lung Association, COPD affects 30 million Americans and is the third leading cause of death in the United States behind cancer and heart disease. Acute exacerbations, defined as a sudden worsening of COPD symptoms, are a major cause of morbidity and mortality in COPD patients.

For patients with severe exacerbations, high levels of carbon dioxide can result in respiratory failure and the need for intubation and mechanical ventilation as life saving measures. ECCO<sub>2</sub>R therapy with the Hemolung RAS allows carbon dioxide to be removed from the blood independently of the lungs with the aim of facilitating the avoidance or reduction of intubation and invasive mechanical ventilation.

**For more information about the VENT-AVOID Trial, visit [clinicaltrials.gov/ct2/show/NCT03255057](https://clinicaltrials.gov/ct2/show/NCT03255057). Interested participants can also email [iscott2@lsuhsc.edu](mailto:iscott2@lsuhsc.edu) or [ksmit9@lsuhsc.edu](mailto:ksmit9@lsuhsc.edu).**

## CENTER FOR CARDIOVASCULAR DISEASES AND SCIENCES RECEIVES CONTINUED APPROVAL AS A CENTER OF EXCELLENCE



At the February Louisiana Board of Regents meeting, the Board gave unanimously support and approval for the continuation of the Center for Cardiovascular Diseases and Sciences (CCDS) at LSU Health Shreveport as a Center of Excellence of research and innovation.

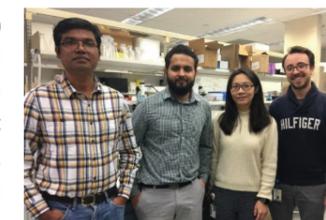
A Center of Excellence is uniquely focused and the highest center designation given by the Board of Regents. It may consist of a unit, program, or functional area that, as a Center, is accountable to higher expectation of performance and productivity, including contributions to the body of knowledge and to economic development, placement of graduates, generation of external interest and support, formation of joint ventures and partnerships, and positive recognition of the area and its faculty and students.

A Center of Excellence must demonstrate that it is a statewide leader in the area of designation and must address how it does so in a proposal to the Board of Regents. With designation as a Center of Excellence comes the responsibility for leadership within the state and, if applicable, beyond. Implied in the designation is a commitment to concentrate and build on this strength by advancing knowledge and skills, thereby creating better opportunities for the citizens of the State. The Center is expected to serve as a resource to support similar programs offered by other institutions.

The three Centers of Excellence at LSU Health Shreveport are: the Center for Cardiovascular Diseases and Sciences (CCDS), the Feist-Weiller Cancer Center (FWCC) and the Center of Excellence for Arthritis and Rheumatology (CEAR).

## AMERICAN HEART ASSOCIATION FELLOWSHIPS AWARDED TO CCDS TRAINEES

Four trainees in the Center for Cardiovascular Diseases and Sciences (CCDS) have received American Heart Association Fellowships to fund their Predoctoral and Postdoctoral training. Dr. Shafiul Alam, a Postdoctoral Fellow in Dr. Shenuarin Bhuiyan's laboratory, received a fellowship to fund his work on cardiac proteotoxicity, a buildup of proteins in the heart that can result in heart failure. Zaki Al-Yafeai, a graduate student in Dr. Wayne Orr's laboratory, received a Predoctoral Fellowship to fund his work on atherosclerotic plaque development, the most common cause of heart attacks and strokes. Two members of Dr. Kevin Lin's laboratory received fellowships, with Dr. Yin Chieh (Celeste) Wu receiving a Postdoctoral Fellowship and Alexandre Do Couto e Silva receiving a Predoctoral Fellowship to fund their work on mechanisms to reduce brain injury following stroke.



**Celeste Yin-Chieh Wu, PhD**, Postdoctoral Associate, was awarded an American Heart Association Postdoctoral Fellowship award of \$110,456 for her two-year project, "Neuropeptide Y-Mediated Neuroprotection."

**Alexandre Do Couto e Silva**, Graduate Student, was awarded an American Heart Association Predoctoral Fellowship award of \$53,688 for his two-year project, "Consequences of Palmitic Acid Methyl Ester in Cerebral Ischemia."

**Zaki Al-Yafeai**, Graduate Student, was awarded an American Heart Association Predoctoral Fellowship award of \$53,688 for his two-year project, "Integrin Affinity Modulation in Endothelial Activation and Atherosclerosis."

**Shafiul Alam, PhD**, Postdoctoral Associate, was awarded an American Heart Association Postdoctoral Fellowship award of \$106,532 for his two-year project, "Sigmar1 autophagic function in protecting cardiac proteotoxicity."



# LSU HEALTH SHREVEPORT & LOUISIANA TECH UNIVERSITY PARTNER TO ESTABLISH NEW RESEARCH CENTER



“This new Center is directly aligned with our commitment to providing the highest quality research, education, and economic development for our state and nation,” said Dr. Les Guice, President of Louisiana Tech University. “This formal partnership has grown from collaborations between our two institutions over several years, and it represents an opportunity to capitalize on the respective strengths of faculty and staff at both institutions.”

The CTERM supports an already established collaborative relationship between LSUHS and Louisiana Tech that includes patents, publications, grants, and a joint MD-PhD academic program, and it will enhance opportunities available to students, researchers and clinicians in a critical area of basic and translational research.

Media and community leaders were invited to a press conference on July 12 celebrating the official announcement of LSU Health Shreveport and Louisiana Tech University collaborating to form the Center for Tissue Engineering and Regenerative Medicine (CTERM).

Dr. Mary Caldorera-Moore, Assistant Professor of Biomedical Engineering at Louisiana Tech University, and Dr. Yufeng Dong, Associate Professor and Director of Translational Research in the Department of Orthopaedic Surgery at LSU Health Shreveport, were introduced as Co-Directors of the CTERM. LifeShare Blood Center in Shreveport will also be involved in the center and working with its researchers and clinicians.

With the recent approval of the LSU Board of Supervisors, the University of Louisiana System Board of Supervisors, and the Louisiana Board of Regents, LSU Health Shreveport and Louisiana Tech University have begun a collaborative research endeavor to establish the **Center for Tissue Engineering and Regenerative Medicine (CTERM)**.

The Center for Tissue Engineering and Regenerative Medicine (CTERM) will focus on the development of cell-based and tissue-engineering therapies to combat tissue inflammation, damage, and loss associated with complications of metabolic syndrome or trauma injury. Specifically, the goal of CTERM is to produce clinically relevant stem cells and biomaterial scaffolds to generate useful cell-based and tissue-based therapies that can combat the loss of healthy tissue associated with chronic diseases.

A multi-disciplinary team of researchers and clinicians from LSU Health Shreveport and Louisiana Tech University will combine their expertise to study chronic health issues that affect the region and parishes across the state, including diabetes, heart disease and cancer. The CTERM will also offer an ideal environment to train future scientists, engineers and clinicians for careers in stem cell biology, tissue engineering and regenerative medicine.

“We are grateful for the approval of the governing boards of LSU and the UL System. This collaboration holds tremendous potential for addressing the issue of tissue loss associated with chronic disease, as well as providing an innovative genre of scientific training,” stated Dr. Chris Kevil, Vice Chancellor for Research at LSU Health Shreveport.



# MULTIPLE LSUHS RESEARCHERS AWARDED NIH R01 GRANTS

## PATILLO: CELLULAR ANTIOXIDANTS DETERMINE VASCULAR REMODELING



**Christopher Pattillo, PhD**, Assistant Professor in the Department of Molecular and Cellular Physiology at LSU Health Shreveport, has received a \$1,825,000 R01 grant from the National Heart, Lung, and Blood Institute of the NIH for his five-year project studying the remodeling of blood vessels following arterial blockage, "Cellular Reductive State Regulates Arteriogenesis." This is Dr. Pattillo's first NIH R01 grant.

"The goal of this NIH-supported five-year study is to determine the levels of antioxidants to drive maximal blood vessel remodeling in response to a vascular blockage, such as peripheral artery disease," explained Dr. Pattillo.

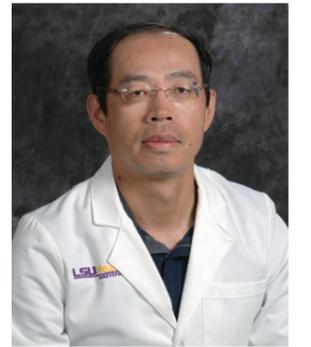
The gradual occlusion of blood vessels such as that reported in peripheral artery disease is increasing in frequency, due to a variety of risk factors including several cardiovascular pathologies such as diabetes, obesity, etc. This project addresses the novel relationship between the antioxidant glutathione, its oxidized form (GSSG) and the protein modifications (glutathionylation) that influence the progression of arteriogenesis following the occlusion of conduit arteries. The proposed research will uncover the underlying mechanisms by which levels of glutathione and corresponding protein modification can be manipulated to enhance the progression of arteriogenesis following ischemic insult; providing potential avenues to the development of novel vascular therapeutics.

Successful completion of this project will provide new insights into the mechanism by which glutathione regulates arteriogenesis in a physiologic range of GSH:GSSG following arterial ligation. Such information could be the basis for new intervention therapies developed to precisely control arteriogenesis following artery blockage. Enhancing the vascular remodeling potential of tissue through manipulation of glutathione and protein glutathionylation may represent a critical first step in attenuating tissue damage due to vascular occlusion.

Dr. Pattillo is the Principle Investigator of the project and Dr. A. Wayne Orr, Professor and expert in shear mediated endothelial biology from the Department of Pathology at LSU Health Shreveport, is a co-investigator.

## DONG: BONE TISSUE REGENERATION USING STEM CELLS

**Yufeng Dong, MD, PhD**, Assistant Professor in the Department of Orthopaedic Surgery at LSU Health Shreveport, has received a \$1,633,905 R01 grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the NIH for his five-year project studying the treatment of bone loss and bone injuries with modified tissue stem cells.



"The goal of this NIH-supported five-year study is to use Notch signaling proteins to modify patient bone marrow derived mesenchymal stem cells (MSCs) and transplant these cells back to the same patient for rapid large bone defect repair, which in turn will help patients heal more quickly after experiencing bone loss," explained Dr. Dong.

Mesenchymal stem cells (MSCs) are a type of stem cells found in bone marrow that have been shown to be capable of making other cells, like bone, cartilage and fat cells. Dr. Dong's project will first purify stem cells from patient bone marrow, and then make them quickly become vessel- and bone-forming cells after transplantation.

At the completion of this study, Dr. Dong and his team will likely be able to accomplish the following:

1. Identify an optimized stem cell population for enhanced vascularization in bone tissue regeneration, and
2. Develop a novel therapeutic approach that would be immediately applicable for patients with massive bone loss, including bone loss secondary to trauma, infectious or oncologic etiologies, bone loss around an artificial joint in adult bone reconstruction, and serve as an adjuvant in the treatment of pediatric skeletal deformities and repairs.

Dr. Dong is the Principle Investigator of the project. The Co-Investigators include: Dr. Chris Kevil, Professor and expert in angiogenesis from the Department of Pathology at LSU Health Shreveport; Dr. Shane Barton, Professor of Orthopaedic Surgery at LSU Health Shreveport; and Dr. Hicham Drissi, Professor of Orthopaedic Surgery at Emory University in Atlanta.

Dr. Dong's project is titled "Notch-enriched Mesenchymal Stromal Cells for Bone Allograft Repair," and this is his first NIH R01 grant.



## ORR: THIRD CONCURRENT R01 GRANT AWARDED

Cardiovascular disease is the most common cause of death worldwide, and a majority of cardiovascular disease-related deaths are due to the formation of atherosclerotic plaques. Atherosclerotic plaques form due to the accumulation of lipids within the artery wall and the recruitment of inflammatory cells to clear these lipids. However, this clearance becomes inefficient over time resulting in chronic inflammation and the formation of lipid and dead inflammatory cell-rich atherosclerotic plaques.

While atherosclerotic plaques can grow to limit blood flow to target tissue, resulting in exertion-associated pain in the chest and legs, the most common cause of clinical events is plaque rupture. When a plaque ruptures, the blood that contacts the ruptured plaque rapidly forms a clot to halt blood flow to target tissues, resulting in a heart attack or stroke. While atherosclerotic plaques can grow to limit blood flow to target tissue, resulting in exertion-associated pain in the chest and legs, the most common cause of clinical events is plaque rupture. Smooth muscle cells in the artery wall act to prevent plaque rupture by forming a protective cap over the plaque core to provide mechanical stability. However, continued inflammation can weaken this protective cap by degrading cap proteins and inducing smooth muscle cell death. The laboratory of **A. Wayne Orr, PhD**, Professor and Director of the Center for Cardiovascular Diseases and Sciences, has a long-standing interest in understanding this response.

Orr continued:

Recently, the Orr lab has identified the protein EphA2 as a novel target in regulating this response. While EphA2 has known roles in tissue remodeling and cancer, the Orr lab provided the first data showing that EphA2 is expressed in atherosclerotic plaques where it regulates multiple aspects of plaque development. Inhibiting EphA2 expression reduces plaque-associated inflammation, but also reduces smooth muscle incorporation into the plaque. Dr. Orr's lab recently received another R01 grant from the National Heart, Lung and Blood Institute of the NIH to study how EphA2 expression is regulated within the plaque, how EphA2 signaling contributes to the production of the protective cap, and whether blunting EphA2-EphrinA1 interactions could provide a dual protective role by reducing plaque inflammation while promoting the formation of the protective cap. This is Dr. Orr's third R01 grant from the NIH, making him the first researcher at LSU Health Shreveport to have three concurrent R01 grants.

## BHUIYAN: SIGMAR1 PROTEIN AND ITS FUNCTION IN REGULATING LIPID METABOLISM



**Shenuarin Bhuiyan, PhD**, Assistant Professor of Pathology, and Cellular and Molecular Physiology, has received an R01 grant from the National Institutes of Health. Dr. Bhuiyan's new \$1,825,000 five-year grant will fund his research project, "Sigmar1 in lipid metabolism."

Obesity, diabetes and heart diseases are characterized by metabolic dysfunction and affect one-third of adults in the United States. Dr. Bhuiyan's proposal will investigate a novel function of protein named Sigma-1 receptor (Sigmar1) in regulating lipid metabolism in baseline and in response to diet-induced obesity. The goal of this application is to discover a novel lipid metabolism pathway regulated by Sigmar1 and identify a therapeutic target to prevent lipid abnormalities in obesity, which is expected to help reverse the impact of obesity on cardiovascular disease risk. Obesity is associated with ectopic

deposition of lipid (steatosis) in different organs including the pancreas, kidneys, blood vessels, liver, skeletal muscle, and heart. The accumulation of excessive toxic lipid species alters cellular signaling, promotes mitochondrial dysfunction, and increases cellular death in these organs.

"We became interested in uncovering the molecular function of Sigmar1 proteins in metabolism as it was reported to be associated with lipid-containing micro-domains suggesting a potential role in the pathophysiology of metabolic diseases. We found that Sigmar1 is abundantly expressed in the heart, where fatty acid oxidation serves as the primary source of energy, approximately 70%," said Dr. Bhuiyan. "Our preliminary data central to this proposal identifies tissue-intrinsic function of Sigmar1 as an essential regulator of lipid metabolism under the normal physiological condition and in response to diet induced obesity stress."

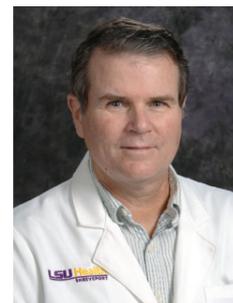
To explain the molecular function of Sigmar1 under physiological and pathophysiological conditions, Dr. Bhuiyan's laboratory recently generated a cardiac-specific Sigmar1 transgenic mouse for overexpression, and cardiac-specific Sigmar1 conditional knockout mouse models. The central hypothesis of the research project proposal is that Sigmar1-dependent activation of lipid metabolism is protective against metabolic stress-induced cardiac dysfunction and pathological remodeling.

Dr. Bhuiyan's research will aim to test this hypothesis by pursuing three specific aims: Aim 1 will determine a novel function for Sigmar1 in regulating lipid metabolism; Aim 2 will determine the role of Sigmar1 in metabolic stress in mouse model of diet-induced obesity; Aim 3 will determine the molecular mechanism of Sigmar1's function in lipid metabolism through mitochondrial fatty acid uptake and oxidation.

Dr. Bhuiyan's lab will use integrated molecular, genetic, and functional approaches in conjunction with genetically modified mice to determine the direct involvement, and define the molecular mechanisms of Sigmar1's role in lipid metabolism. This proposed project will identify a novel therapeutic target to regulate mitochondrial fatty acid oxidation and discover a novel molecular mechanism of cellular protection in diet-induced obesity.

## NEW R15 GRANTS AWARDED TO WITT & McMARTIN

The goals of a NIH R15 grant are to support meritorious research, expose students, especially undergraduate students, to research, and strengthen the research environment of the institution.



A new \$438,000 R15 Academic Research Enhancement Award (AREA) grant from the National Institutes of Health is making it possible for a researcher at LSU Health Shreveport to study Parkinson's disease, a neurodegenerative movement disorder that affects approximately seven to ten million people around the world. **Stephan Witt, PhD**, Professor and Chairman of Biochemistry and Molecular Biology at LSU Health Shreveport, was recently awarded federal funding from the General Medical Sciences Institute of the National Institutes of Health (NIH) for his three-year project investigating how the Parkinson's disease-associated protein alpha-synuclein disrupts the orchestrated transport of proteins to and from the cell surface. This is Dr. Witt's third NIH grant to study Parkinson's disease.

"There are still many questions to be answered about the alpha-synuclein protein and how it functions," said Dr. Witt. "It is an important focus of Parkinson's disease research because this protein is found in Lewy bodies. Lewy bodies are clusters of proteins found in brain cells that could hold important information about what causes Parkinson's. The cause of this disease is currently not known, which is why research is so important."

The NIH's General Medical Sciences and Neurological Disorders and Stroke Institutes have funded Dr. Witt for 19 years. He has also received grants from the American Cancer Society and the American Parkinson's Disease Association. In addition to his research, Dr. Witt serves on the editorial boards of Cell Stress & Chaperones, Journal of Biological Chemistry and PLOS ONE.

**Kenneth E. McMartin, PhD**, Professor in the Department of Pharmacology, Toxicology and Neuroscience, is the Principle Investigator of a new \$435,000 R15 grant from the NIH's National Institute of Environmental Health Sciences. His project, "Neurotoxicity and nephrotoxicity of diglycolic acid: a model of calcium chelation-induced mitochondrial dysfunction," began in August of 2018 and is funded for three years.



Diethylene glycol (DEG) is a commonly used chemical found in consumer products such as brake fluid and chafing fuels in the United States. DEG is also a good and cheap solvent that has mistakenly been used to prepare liquid medications throughout the developing world, and thus has produced highly-fatal poisoning epidemics in which it has produced a failure of the kidney and damage to peripheral nerves leading to paralysis. Despite widespread knowledge of its epidemic toxicity, the mechanisms for the toxicity of DEG, and especially the link between the nephrotoxicity and the neurotoxicity, are not well understood.

"We have recently demonstrated that a DEG metabolite known as diglycolic acid (DGA), rather than DEG itself, is responsible for the kidney injury and that it does this by damaging mitochondria. However, there is hardly anything known about how DEG produces the nervous system damage, so we propose studies to develop a model for the nervous system damage," said Dr. McMartin.

Dr. McMartin's lab will use this model and cell cultures to investigate whether DGA produces the kidney and nervous system damage by removing cellular calcium, which then leads to the loss of mitochondrial function. These studies will determine how DGA affects intracellular calcium homeostasis, whether its chelation property alters neuronal and kidney cell viability, and what the characteristics are of the DGA-associated neuropathy. They also provide the necessary mechanistic results to design and evaluate effective therapies for these severe poisonings. Furthermore, these studies will significantly impact kidney and nervous system health by producing a model for studying how renal agents may induce neuropathies.

# SPOTLIGHT ON: PH.D. STUDENT RESEARCH

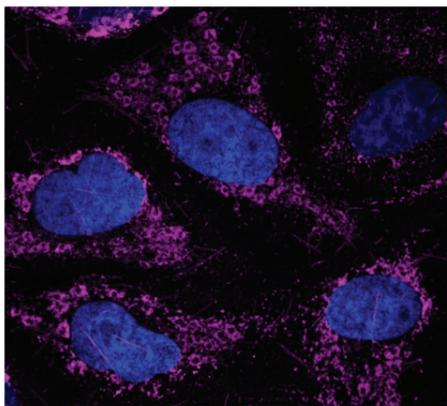
SAMANTHA K. MURPHY (HOMETOWN: BOSSIER CITY, LA)



My name is Samantha Murphy and I am a fourth year Ph.D. student in the Department of Microbiology and Immunology at LSU Health Shreveport. I grew up primarily in Bossier City, Louisiana, where I decided to pursue a degree in nursing at Bossier Parish Community College. Upon graduating from BPCCC in 2009, I realized that I was more interested in basic science so I attended LSU Shreveport and had the amazing opportunity to work in research, specifically in feeding ecology and plant pathology. Upon graduating in 2013 Cum laude with a BS in Biology, I stayed at LSUS to pursue a MS in Biology. My thesis project was to identify proteins in cancer cells that interact with a drug called FC-101. FC-101 is a fungal toxin that kills invasive cancer cells but is relatively harmless to normal cells. After graduating in 2015, I was accepted into the Department of Microbiology and Immunology as a Ph.D. student where I joined the lab of Dr. Michelle Arnold. Dr. Arnold's lab studies a virus called rotavirus, which causes severe diarrhea in young children. Rotavirus can shut down the innate immune response during infection. The innate immune response is the first line of defense against pathogens so it is especially important in children less than 5 years old because their immune systems have not fully developed. Rotavirus encodes a viral protein known as nonstructural protein 1 (NSP1) that can shut off the innate immune response during early infection. Dr. Arnold has focused much of her research on understanding how NSP1 shuts off the innate immune response by promoting

degradation of host proteins. My research took an interesting turn during my time in Dr. Arnold's lab. We are the first lab to observe NSP1 in the nucleus of cells during infection, which suggests that NSP1 can do more than promote degradation of host proteins in order to shut down the innate immune response. We are currently going through the process of getting this interesting data published in a scientific journal!

Outside of my work as a Ph.D. student, I am a married mom of two awesome kids and five awesome pets. I thoroughly enjoy playing video games and checking out events in the Ark-La-Tex.



This is a confocal image I took of a cell infected with rotavirus. The nucleus is stained in blue (DAPI) and the magenta donut-like structures throughout the cytoplasm is a viral protein called VP6. These are areas where new virions are being assembled inside the cell.

I am actively involved in several student organizations at LSUHSC-Shreveport such as Science Matters, Graduate Student Council and Executive Council. As the VP of Public Relations for Science Matters, I have had the wonderful opportunity to share science with the public. I also share snippets of my work life and my life outside of work on my personal social media accounts (particularly Twitter and Instagram). I do this because I like breaking down complex scientific concepts in a way that can be understood and enjoyed by non-scientists and I want people to view scientists as normal human beings.



Children are natural-born scientists and I was no exception. My father was a Master Sergeant in the Air Force who worked on rockets and missiles. As a single parent, he attended the launches with my sister and I in tow. I was always curious about space and imagined what it would be like to explore other planets. My inspiration to pursue a career in science really began with a science history lesson at school. We learned about Sally Ride, the first American woman in space. Since that day, Sally Ride has been my role model. Although I eventually realized that the astronaut life was not for me, I would like to run my own lab at an academic or government institution. I am very interested in understanding how persistent pathogens hide so well within their hosts by controlling the immune response. My other hope in running a lab is to create career opportunities for those who are underrepresented in science and make connections between local communities and scientists.



One of the highlights of being a scientist is solving puzzles and exploring the unknown. I greatly enjoy using the scientific process to answer interesting questions. I also enjoy sharing our findings with the community. So far, my biggest struggle is maintaining my work-life balance. In order to spend time with my family, I have to be organized and thoughtful with how I spend my time at work. I must also be organized and thoughtful with how I spend my time at home. It can be exhausting at times. Being a scientist means that your schedule is not always consistent and experiments don't always work. Sometimes, you have to go back and answer

other questions before you can answer your big question. It's easy for science to consume your life if you do not plan your time wisely. I am able to power through the challenges of being a scientist with a sense of humor. It is important to find ways to cope with sense of failure and frustration that come with negative data. Not every experiment will yield a positive result and you make mistakes regularly. Sometimes, you may not realize that you made a mistake until you've completed the experiment. It is important to learn from these mistakes without taking them personally. I have found that having a sense of humor lessens the sting of a failed experiment and helps with the learning process!

If anyone is interested in becoming a scientist, my best piece of advice is to never turn down an opportunity to tinker and explore. As a scientist, you are a problem solver and the answers to some of these problems may not exist yet. This is where it is important to be creative! So, don't hesitate to paint and experiment with creating different colors. Don't hesitate to build model cars or airplanes and play with them. Play outside and collect rocks or make flower crowns and build pillow forts. Most importantly, share your creations with others. You may not realize it because you're having so much fun, but you are building some of the most important skills a scientist can possess; the ability to create and share your discoveries. Finally, ask questions and stay curious but learn how to be resourceful when answering your own questions. I think it is incredibly important that parents and teachers show kids how to answer their own questions. Praise kids when they find the right answer and ensure that kids remain encouraged if the answer was incorrect or incomplete. Allow kids to make mistakes and show them how to change their approach when troubleshooting. Finally, if the opportunity presents itself, give the kids a chance teach you about their discoveries so they can sharpen their leadership and communication skills.

Photos courtesy of Samantha K. Murphy

# CAMPUS & COMMUNITY

## NWLA Go Red for Women Luncheon



Cardiovascular disease is the leading cause of death in both men and women, and accounts for 1 in 4 deaths every year. It is the mission of the Center for Cardiovascular Diseases and Sciences at LSU Health Shreveport to advance the understanding of cardiovascular disease and develop the next generation of basic and clinical science investigators to one day be able to change this statistic. CCDS researchers are funded by the National Institutes of Health and the American Heart Association.

Researchers from the Center for Cardiovascular Diseases and Sciences attended the American Heart Association's Northwest Louisiana Go Red for Women Luncheon. Dr. A Wayne Orr, Director of the CCDS, spoke at the luncheon about the importance of cardiovascular disease research, and Zaki Al Yafeai, Dr. Celeste Wu, Dr. Shafiul Alam and Alexandre Do Couto E Silva were recognized as American Heart Association Fellowship recipients.

*Since 1980, the American Heart Association has granted over \$8 million to fund research in Northwest Louisiana.*

## LSUHS STEM Display at BAFB Air & Space Show

School of Graduate Studies students Samantha Murphy, Courtney Jamison, and Randa Eshaq attended the Barksdale Air Force Base Defenders of Liberty Air & Space Show and created fun and interactive ways to engage with Air Show attendees. At their booth in the STARBASE Louisiana STEM Zone there were posters and interactive activities where they taught kids about their eyes, kidneys and hand washing. They highlighted the importance of STEM in the world around us, from our bodies and everyday habits, to discoveries made in research labs in Shreveport, to the International Space Station.

The STARBASE STEM Zone was especially created for younger attendees of the Air Show. It featured fun activities and exhibits relating to Science, Technology, Engineering, and Math.



## BioStart Program Welcomes New Interns

The BioStart Program recently welcomed the 2019-2020 class of interns. The Southwood High School students who were accepted to participate in the BioStart Program learned who their mentor would be and received their white coats in front of family, friends, and school leadership. The LSU Health Sciences Foundation in Shreveport, the Biomedical Research Foundation, and other generous partners provide funding for the BioStart Program.

The BioStart Program, which is overseen by Kenneth McMartin, PhD, Professor of Pharmacology, Toxicology & Neuroscience, offers a research experience to selected seniors of Southwood High School's BioTechnology Magnet Program. During their fall semester the senior students are paired with a LSU Health Shreveport Faculty Mentor and work in their research laboratory daily for about four months. The BioStart Program hopes to increase the quality and quantity of area graduates in the medical, biotechnology and life sciences fields with the expectation that many of these students will earn advanced degrees and participate in the regional workforce as medical professionals, research scientists, teachers and technicians.

The students will officially begin working with their mentors on their research projects in August when school starts back and will share their projects at a poster session at the end of the semester.

**Southwood Student:** SheKeira Rice

**Mentor:** Xiao-Hong Lu, PhD, Assistant Professor of Pharmacology, Toxicology & Neuroscience

**Southwood Student:** Arizona Minister

**Mentor:** David McGee, PhD, Associate Professor of Microbiology and Immunology

**Southwood Student:** Zion Hines

**Mentor:** Hyung Nam, PhD, Assistant Professor of Pharmacology, Toxicology & Neuroscience

**Southwood Student:** Miranda Thomas

**Mentor:** Christopher Pattillo, PhD, Professor of Molecular and Cellular Physiology

**Southwood Student:** Dakota Ivy

**Mentor:** Christopher Schmutz, PhD, Assistant Professor of Pharmacology, Toxicology & Neuroscience

**Southwood Student:** Chaniya Simpson

**Mentor:** Gulshan Sunavala, PhD, Assistant Professor of Cellular Biology and Anatomy

**Southwood Student:** DaNeis Brown

**Mentor:** Yunfeng Zhao, PhD, Associate Professor of Pharmacology, Toxicology & Neuroscience





## INTERACTIVE DAY OF EDUCATION & AWARENESS FOR SCIENCE

By: Madison El-Saadi, PhD Candidate & President of Science Matters - Shreveport



On Saturday, February 16, the Science Matters - Shreveport student interest group hosted its third annual Interactive Day of Education & Awareness for Science (I.D.E.A.S.) event at LSU Health Shreveport. School of Medicine, School of Graduate Studies, and School of Allied Health Professions, undergraduate and high school student volunteers performed 50 scientific demonstrations for children ranging from ages 4 to 17-years-old. I.D.E.A.S. is fully orchestrated by LSU Health Shreveport students who are elected to serve one-year terms as officers. The Science Matters student interest group started in late 2016 as part of the widespread response to counter the anti-science

sentiment that had crept into the national spotlight. We first organized Shreveport's satellite March for Science in April 2017 to gather with our local community to show support for the larger scientific community in our country. Since then we have hosted multiple events, both small and large, to share with our community the importance of science in our daily lives. The feedback we have received from community members has been one of the most rewarding experiences in my time as a PhD candidate and President of Science Matters.

Although we host many events, I.D.E.A.S. is our largest and requires an exceptional effort and months of organizing. This year, Meagan Tinsley, MSII, our group's VP of Education, and Amber McKenna, MSIII, who conceived I.D.E.A.S. in 2017, led the event. Meagan appointed seven committee heads, all medical students, who tackled various aspects of the event. Despite a large classroom and/or clinical workload, together these nine exceptional students planned, organized and executed a flawless event for the sole purpose of offering local students and others a chance to experience science up close and personal.

During the event, I asked multiple volunteers a simple question: "Why allocate so much work toward this event, given you have little to gain?" Although each person answered differently, all of their answers were shades of the same. Most of us can think back to a moment in our life when we were young, a moment when something first struck our curiosity about the natural world, and for us, those early seeds have manifested in our pursuit of higher education.

The children who attended our event live in a state that has failed to prioritize STEM. Pre-K and K-12 education endured a decade of deep cuts or stagnant financing, and higher education funding dipped 55% since 2008<sup>[1]</sup>. There is reason for optimism - the recently approved state budget provides \$30 million for Pre-K, \$140 million for K-12 and \$47 million for higher education<sup>[2]</sup>; these numbers could represent a turning point in Louisiana's prioritization of public education!

As PhD and medical students, we were honored and excited to deliver strong STEM (science, technology, engineering and mathematics) exposure to younger students as research finds that stimulating a student's interest in STEM topics before middle school greatly increases the probability of that student graduating high school, procuring a higher degree and going on to have a career in STEM increases. Encouraging students to explore and pursue a STEM degree means a better job, which we know from common sense often means a better life. Although we have no way of knowing the impact I.D.E.A.S. has on any given child who attended, we hope our efforts sow the early seeds of interest in science, which could manifest in to a better and more rewarding life for them the way it has for all of us.

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## IN MEMORIUM

### RONALD KLEIN, PhD



Ronald Klein, PhD, Professor in the Department of Pharmacology, Toxicology and Neuroscience, passed away in March of 2019 at age 53. Dr. Klein joined the LSU Health Shreveport faculty in 2002.

Dr. Klein's research work focused on therapeutic options for neurodegenerative diseases and he had strong compassion for patients who suffered with ALS, Parkinson's disease, Alzheimer's disease and traumatic brain injuries. His goal was disease modification based on the premise that better, more appropriate animal models would accelerate discovery. The driving force behind his research was his recognition that there was a need to expand the very limited therapeutic options for these diseases.

Dr. Klein received grants from more than 20 sources including the National Institutes of Health, the The Michael J. Fox Foundation, the Parkinson's Foundation and Alzheimer's Association. He served as an ad hoc grant reviewer for the NIH, VA, and Department of Defense, and served on the board and reviewed for more than 30 respected publications with more than 100 peer-reviewed manuscripts and abstracts. He mentored dozens of medical students, graduate students and residents.

Dr. Klein leaves a legacy at LSU Health Shreveport as a teacher and researcher who made a difference in the lives of his students, his colleagues, and countless patients who will someday be impacted by his work.



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