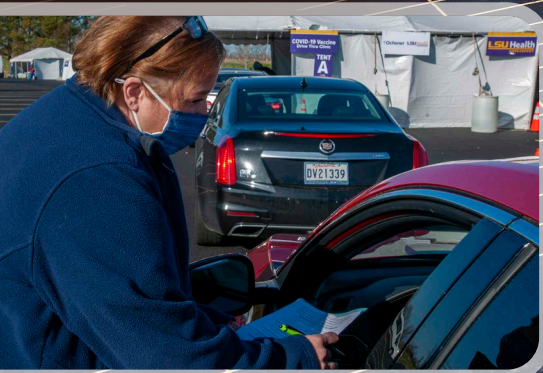


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2021 • VOLUME 1

First Mass Vaccination Clinic
in Bossier City, LA



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, neuroscience, tissue engineering and regenerative medicine, and addiction. 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 six 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.

From the Chancellor



G. E. Ghali, DDS, MD, FACS, FRCS(Ed)

Chancellor, LSU Health Shreveport

Dear Friends,

It is with great enthusiasm that I provide a few words of introduction for this issue of *Inside Research* magazine. Since the last issue of the magazine which was 100% focused on the enormously positive role research has played in the pandemic response, our scientists, researchers and research administrative staff have continued their service to the community through testing, vaccinations, sequencing of the virus and education on each of these topics. Concurrently, research has continued their upward trajectory of securing external research funding.

The pending physical expansion of the Center of Excellence for Emerging Viral Threats, as part of the \$78 M Center for Medical Education, which will begin construction in May holds great promise for securing additional external funding as the National Institutes of Health (NIH) now fully appreciates the importance of providing funding to those institutions who are poised to prepare for the pandemics of the future. Also of positive note is the international recognition of LSU Health Shreveport's contribution to sequencing of the COVID-19 virus. The media attention garnered because of our robust sequencing and discovery of COVID-19 variants has clearly positioned our institution as a leader in sequencing further enhancing our ability to recruit and retain top faculty.

I want to close with publicly praising and acknowledging the outstanding work and accomplishments of our entire research team including our post-docs, faculty, staff and leadership. Their relentless focus on pursuing every available research dollar all while continuing to offer easily accessible testing and vaccinations is positioning our community to rebound promptly from the economic and health challenges of this historic pandemic.

Sincerely,

G. E. Ghali, DDS, MD, FACS, FRCS(Ed)

Chancellor, LSU Health Shreveport

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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

For more than a year LSU Health Shreveport has been in the vanguard, leading Louisiana and much of the nation as our faculty scientists and physician specialists collaborate against the novel coronavirus that causes COVID-19. Our entire team has been humbled by the national and international acknowledgement of LSU Health Shreveport's leadership contributions to a better understanding of the virus as well as in development of effective treatments.

Academic health sciences centers like LSU Health Shreveport exist to serve the public good through complementary healthcare education programs and scientific research both centered around patient care. When the COVID-19 public health emergency erupted in March 2020, LSU Health Shreveport responded by immediately mobilizing and devoting considerable resources including faculty expertise, specialized laboratories, and clinical trial research to contain the growing public health emergency sweeping Louisiana, the United States, and the world. As many of you may know, our outstanding team of scientists, physicians, staff, and administrative leaders worked tirelessly to create the initial Emerging Viral Threat (EVT) lab that grew rapidly over a short period and became a Louisiana Board of Regents recognized Center of Excellence for Emerging Viral Threats (CEVT).

Most recently, LSU Health Shreveport CEVT has been crucial for mass distribution of COVID-19 vaccines in establishing the area's first large-scale community vaccination clinics. Our mass vaccination clinics have been held in both urban and rural locations strategically selected to maximize public access and to remove or minimize geographic, social and economic barriers to life-saving vaccine for all Louisianans.

Below are some of the highlights LSU Health Shreveport leadership against COVID-19 including:

- First site in Louisiana, and among the earliest in the nation, to offer convalescent plasma transfusions to critically ill patients. First site in Louisiana, and only the second in the United States, to offer the inhaled nitric oxide clinical trial conducted also at Harvard (Massachusetts General Hospital), and the University of Alabama in Birmingham. LSU Health Shreveport remains one of only six locations in the world approved for this trial.
- Expansion of EVT Lab capabilities to include serology testing, needed to determine asymptomatic individuals who have recovered from the virus that supports therapeutic use of Convalescent Plasma Therapy at both Ochsner LSUHS Academic Medical Center and other health care systems. The sole Pfizer vaccine trial site in north central Louisiana, LSU Health Shreveport has reached every benchmark of the Pfizer trial in record time. Helped contain spread of COVID-19 by designing a successful testing regiment adopted by 95% of the nursing homes and assisted living facilities within nine parishes in Northwest Louisiana. Implementation of this regiment yielded one of the lowest COVID-19 negativity rates in the nation. In the nine months of the public health emergency prior to availability of vaccine for senior citizens, the LSU Health Shreveport Testing Strike Team held positivity rates in these nursing homes and assisted living facilities to an average of only 2 percent. The current positivity rate is below a quarter of a percent.

While we are proud of these amazing accomplishments, the best is yet to come. Many other research advancements have also occurred at LSU Health Shreveport during this time outside of COVID-19 that set us on a strong trajectory for future growth in the coming months and years. Importantly, research from our centers and faculty laboratories across our campus, and in clinical trials, are thriving throughout north Louisiana and are leading to new successful commercialization efforts derived from US and international patents based on these accomplishments. I invite you to learn the latest about your LSU Health Shreveport's research highlighted in this edition of Inside: Research.

Sincerely,
Chris Kevil, PhD
Vice Chancellor for Research

OFFICE OF RESEARCH

Chris Kevil, PhD

Vice Chancellor for Research
Dean, School of Graduate Studies

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Office of Clinical Trial Services

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Michelle Cavanaugh, BS

Senior Fiscal Analyst

V. Hugh Price, DVM

Director of Animal Resources

CENTERS

*A select number of academic programs earn the designation as a **Center of Excellence** by the Louisiana Board of Regents. Centers of Excellence must demonstrate statewide leadership in their area of designation and be a hallmark for the institution. The selected centers share a strong performance record, concentration on an area relevant to the state's needs, a range of academic, training and research opportunities, engagement with the greater community, and a focus on issues and opportunities that improve the quality of life of Louisiana citizens. Four LSU Health Shreveport centers have earned this distinction: **Feist-Weiller Cancer Center of Excellence, the Center of Excellence for Arthritis and Rheumatology, the Center for Cardiovascular Diseases and Sciences and the Center of Emerging Viral Threats.***

Center for Brain Health (CBH)



In an effort to meet the required criteria for maintaining status as a Center, the Center for Brain Health is pleased to report two new grants supporting their efforts. Elizabeth Disbrow PhD, Director of the Center for Brain Health and Assistant Professor in Neurology, received a \$50,000 grant for use in partnering with the Primary Care Clinic at Ochsner LSU Health Shreveport to examine clinical, manpower, financial, logistic, technical, social, and literacy related barriers and facilitators to the use of telemedicine as a tool to provide accurate diagnoses, specialty care and caregiver support for ADRD. Through the awarded grant the Center will evaluate facilitators and modifiable barriers to remote diagnosis, research participation, and modify a remote ADRD care navigator system to address the needs of underserved populations. Leadership continues to advocate for rural parishes in securing funding from federal sources in partnership with qualified health centers.

Suzanne Tinsley, PT, PhD, Associate Director for the Center for Brain Health and Associate Professor of Rehabilitation Sciences secured a grant for the Noel Foundation to provide enhanced technology for neuro rehab patients and in the teaching of physical therapy students. LSU Health Shreveport is the first location in the world to acquire the Bioness BITS Balance equipment due to their development of this cutting-edge technology geared to improve balance and upright functioning. The ability to enhance balance and upright mobility will tremendous benefit patients dealing with brain health issues such a Alzheimer's, Parkinsons, and strokes.

Center for Cardiovascular Diseases and Sciences (CCDS)

At a glance: The CCDS was awarded over \$850,000 in intramural grants and provided over \$580,000 in additional research support in 2019-2020. Faculty and trainees brought in over \$11 million in extramural funding in the last year. CCDS faculty have again increased their funding over the last year, bringing in more grant dollars this year than any in CCDS history. The CCDS trainees received three new AHA Post-doctoral Fellowships this year. CCDS clinicians and volunteers held the first annual Heart Health Day, providing free health screening and educational activities, and clinician scientists continue to advance treatment of cardiovascular disease in the Ark-La-Tex by participating in clinical trials, offering cutting-edge treatments, and providing additional training to the Ark-La-Tex healthcare workforce. Finally, the CCDS ended the 2019-2020 academic year by funding a variety of intramural studies on the cardiovascular complications of COVID-19, establishing a core facility to facilitate cell culture models of cardiovascular COVID-19 infection, and initiating multiple clinical trials to improve the diagnosis and treatment of these cardiovascular complications. The CCDS Biorepository Unit was established to create an extensive collection of bio specimens and associated clinical data from ongoing IRB-approved studies. All Biorepository samples are accessible not only to our own researchers, but to researchers around the country who are jointly fighting against cardiovascular disease, and also to investigators studying the COVID-19 pandemic.





Center of Excellence for Arthritis and Rheumatology (CEAR)



For over 10 years, the Center for Arthritis and Rheumatology has sustained and expanded programs of excellence in clinical patient care, medical education and research. The \$10.6 million dollar 5-year CoBRE from the National Institute of Health (NIH) was funded to create the research immunology center which continues to follow their mission of engaging in multidisciplinary and interdepartmental clinical, research and education to provide patients with cutting-edge care. The Pediatric Rheumatology Clinic in the LSU Health Ambulatory Care Center, run by Dr. Sarwat Umer is only the second clinic of its kind in the state treating children with juvenile arthritis and autoimmune diseases. The Rheumatology fellowship program has expanded to 3 fully funded fellows each year for the 2-year fellowship.

This year, CEAR awarded research grants; one of which was for the study Use of blood flow restriction training on strength function and outcome in Rheumatoid Arthritis patients. The center was well represented at the American college of Rheumatology with multiple abstracts and presentations at the national meeting. CEAR faculty continue to advance the science through the scleroderma clinic trial consortium at EULAR European Rheumatology meeting, as well as being published in Rheumatology 2020. The center also has upcoming publications in Forum Magazine on MISC Post-COVID complications in children and in Rheumatologist MDA 5 associated myositis.

Center of Excellence for Emerging Viral Threats (CEVT)



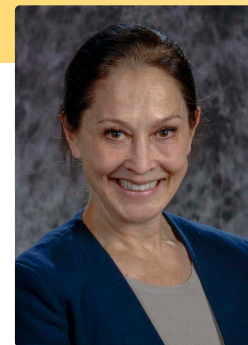
LSU Health Shreveport Gains Approval from the LSU Board of Supervisors and Louisiana Board of Regents for establishment of the Center of Excellence for Emerging Viral Threats

The Louisiana Board of Regents unanimously supported a one-year initial approval of the Center for Emerging Viral Threats (CEVT) and one-year conditional designation as a Center of Research Excellence. A proposal for continued authorization is due on February 1, 2022. The Board of Regents approval follows unanimous approval by the LSU Board of Supervisors on December 11, 2020 to recognize the Center for Emerging Viral Threats as a Center of Excellence.

Dr. Chris Kevil, Vice-Chancellor for Research at LSU Health Shreveport (LSUHS) shared, “We are humbled by the vote of confidence by the Louisiana Board of Regents and the LSU Board of Supervisors as we recognize the honor of being approved as a center of excellence. The faculty and staff of the Center of Emerging Viral Threats are fully committed to deliver the testing, clinical/vaccine trials and research required to move our community beyond this pandemic as quickly as possible. Receiving designation as a Center of Excellence will strengthen our position to compete for grant funding and in preparing for the pandemics of the future.”

The designation as a Center of Excellence is rigorous process and requires proof of the center's qualifications for the distinction. Qualifications include being a statewide leader in the area of designation, provision of a range of academic, training of research opportunities, a focus on current issues and the ability to advance the strategic goals of the institution and the State of Louisiana.

“The CEVT represents a central priority for the administration and faculty of LSU Health Shreveport through the engagement and intersection of critical public health needs, timely clinical and vaccine trials and delivery, timely and accurate COVID-19 testing, needed basic science and clinical research, key SARS-CoV2 and other pathogen clinical diagnosis, important education and outreach, surveillance, and the required training of future scientists, physicians and other health related work force members,” stated Dr. G. E. Ghali, Chancellor of LSU Health Shreveport.



Sarah Thayer, MD, PhD, FACS
Director, Feist-Weiller Cancer Center

Feist-Weiller Cancer Center – Center of Excellence



Sarah Thayer, MD, PhD, FACS has been selected as the next Director of Ochsner LSU Health Shreveport – Feist Weiller Cancer Center effective February 1, 2021. Dr. Thayer's role as Director of the Feist-Weiller Cancer Center includes both a clinical leadership role with Ochsner LSU Health Shreveport and a research and medical education leadership role with LSU Health Shreveport.

The Feist-Weiller Cancer Center is recognized as a Center of Excellence by the Louisiana Board of Regents and was established and funded by the Louisiana Legislature in 1990 for the development and expansion of multidisciplinary, interdepartmental research, clinical programs, and education.

Dr. Thayer comes to us from the University of Nebraska Medical Center where she served as:

- Physician-in-Chief of the NCI Designated Fred & Pamela Buffett Cancer Center (FPBCC)
- Associate Director for Clinical Affairs
- Chief of the Division of Surgical Oncology
- Merle M. Musselman Centennial Professor of Surgery

She actively practices as a pancreatic and breast cancer surgeon and an NCI funded investigator with research focused on the initiation, progression, and regulation of pancreatic cancer. Prior to joining the University of Nebraska Medical Center, she spent 13 years at Massachusetts General Hospital and the Harvard Medical School.

Dr. Thayer earned an undergraduate degree in biology from Earlham College in Richmond, Indiana and a Master in Science degree in physiology and biology from Georgetown University in Washington, DC.

Her medical degree was awarded by the University of Virginia School of Medicine and her surgery residency was completed at Massachusetts General Hospital. Dr. Thayer continued her education earning a PhD at Cornell University Graduate School of Medical Sciences followed by a year of focused study in surgical oncology at Massachusetts General Hospital. Most recently, she completed coursework at the Harvard Business School focusing on Managing Health Care Delivery.

Louisiana Addiction Research Center (LARC)



The Community Foundation awarded Dr. Kevin Murnane with an equipment grant to do wastewater sampling. The emergence of the COVID-19 pandemic created a public health crisis of unprecedented magnitude. Even with therapeutic advances and vaccine development, surveillance systems are a critical component in maintaining the overall public health. By testing municipal sewer systems, LSU Health Shreveport seeks to identify vulnerable communities and provide early detection of emerging outbreaks. The new equipment will allow researchers to quickly identify biomarkers and genetic markers for any impending coronavirus outbreak.

In addition to acquiring new equipment, the inaugural LARC Mental Health Summit was held on April 22nd with a focus on suicide prevention and various mental health topics. The virtual event was open to the public, health care providers and young adults interested in health care professions. Diverse backgrounds from seasoned practitioners to students-in-training had access to 7.75 free hours of CME/CEU credit. The summit provided more in depth understanding on the mental health consequences of the COVID-19 pandemic, particularly as it relates to stress, social isolation, substance use, and suicide prevention.

*In addition to the six Louisiana Board of Regents and LSU Board of Supervisors approved Centers, LSU Health Shreveport has **three National Institutes of Health (NIH) Centers of Biomedical Research Excellence (COBRE).***

Center for Molecular and Tumor Virology

The Center for Molecular and Tumor Virology, directed by Dr. Martin Sapp, was established in 2002 and has been supported by three consecutive NIH COBRE grants totaling \$22.9 million. The Center consists of research labs dedicated to investigating viruses and the diseases they cause. The goals of the Center for Molecular and Tumor Virology (CMTV) are to bring together scientists who direct independent but interactive research programs in molecular and tumor virology, mentor new faculty and students, expand virology research infrastructure in our region, and foster collaboration. 55 Postdoctoral fellows and 39 PhD students have been trained in CMTV labs during its existence, with more students in training now.

The Center has hosted dozens of national and international leaders in virology and has helped train over 100 fellows and students. We support and maintain state of the art equipment and facilities for use by members of the Center and the broader LSU Health Shreveport community.

Center for Redox Biology and Cardiovascular Disease

The Center for Redox Biology and Cardiovascular Disease, directed by Dr. Chris Kevil, was established in 2018 and is supported by a five-year, \$10.5 million NIH COBRE grant. The primary goal for this center includes strengthening the institutions biomedical research infrastructure through establishing a thematic multi-disciplinary center. To accomplish this goal, Core facilities have been established including an Administration Core (Core A), an Animal Model & Histology Core (Core B), and a Redox Molecular Signaling Core (Core C). Also established are advisory committees (both internal and external) that provides guidance to program junior faculty and COBRE leaders as well as scientific and professional development meetings that further scientific excellence at LSU Health Shreveport.



Andrew D. Yurochko, PhD

Center for Applied Immunology and Pathological Processes (CAIPP)

LSU Health Shreveport recently received a 5-year grant for \$10,529,128 from the National Institute of Health (NIH) to establish a third Center of Biomedical Research Excellence, or COBRE. The COBRE funds will establish the **Center for Applied Immunology and Pathological Processes (CAIPP)**, which will be operate on the LSU Health Shreveport campus. This National Institute of Health (NIH) federal funding has been granted for the next five years with the option to renew for an additional 5 to 10 years.

Dr. Andrew D. Yurochko, Professor and Carroll Feist Endowed Chair of Viral Oncology; Department Vice-Chair of Microbiology and Immunology, and Director of the Center of Excellence for Emerging Viral Threats is the principal investigator for the grant and will be the Director of the new center. Dr. Rona S. Scott, Associate Professor and Mingyu Ding Professor of Microbiology and Immunology, Dr. Matthew D. Woolard, Associate Professor and O'Callaghan Family Endowed Professor in Microbiology, and Dr. Martin J. Sapp, Department Chair and Professor of Microbiology and Immunology and Willis Knighton Chair of Molecular Biology are key senior faculty that played an essential role in the awarding of this application and will continue to contribute to the center through their role as Directors of the cores within the new center. Drs. Xiaohong Lu, Assistant Professor of Pharmacology, Toxicology and Neuroscience, Ana Dragoi, Assistant Professor in Molecular and Cellular Physiology, and Monica Cartelle Gestal, Assistant Professor of Microbiology and Immunology are key junior faculty that are involved in the research components of the center.

The COBRE will allow research under a newly established Center for Applied Immunology and Pathological Processes (CAIPP); providing a unique interactive training and research environment for investigators to receive mentorship and guidance, simultaneously increasing the competitiveness of their research programs for national funding. The goal is to 1) grow, recruit and retain new talent 2) expand existing research 3) grow infrastructure using new equipment and experience that encourages statewide collaboration. The proposed Center will allow the development and growth of the key infrastructure needed to support members of the CAIPP Center, as well as researchers throughout the region and state. Harnessing the collective strengths of departments and schools within the state and region, the CAIPP will advance new insights and understanding for how the immune system functions. These proposed studies go hand and hand with the needs of the citizens of the State of Louisiana where diseases associated with altered immune responsiveness take a significant toll on the health of the citizens of the state, as well as financially on the health care system within the state. With understanding of the molecular and clinical basis for these diseases and the resulting immunopathologies, scientists hope to discover new and better ways to detect and treat these various diseases.



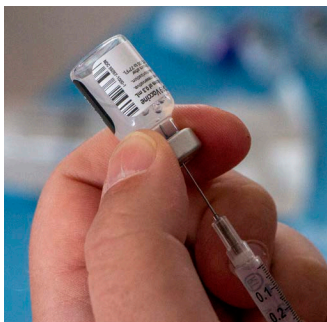
TESTING, VACCINATIONS, and GENOME SEQUENCING

LSU Health Shreveport supports community through COVID-19 PREVENTION EFFORTS



Community Testing and COVID-19 Vaccine Efforts

LSU Health Shreveport (LSUHS) continues COVID-19 testing, while simultaneously offering large scale vaccine clinics and leading Louisiana in sequencing the virus from positive test samples. Testing and vaccine sites are located throughout Northwest Louisiana—including Minden, Monroe, Ruston and rural outlying cities like Tallulah. A concerted effort has been made to deliver testing and vaccines regardless of the ability to register or travel far outside of one's home as "access for all" has been a guiding principle for the delivery these services.



The LSUHS COVID-19 Strike Team has demonstrated an abiding commitment working in cold, rain, bristling winds, and other inclement weather conditions. As of April 1, 2021, these Strike Teams have administered over 300,000 COVID-19 tests and over 52,000 vaccines since the Emerging Viral Threat lab opened on March 25, 2020.



Testing and vaccine clinics are organized and directed by John Vanchiere, MD, PhD, Professor of Medicine, Pediatrics & Infectious Disease and Principal Investigator for the local Pfizer vaccine clinical trial. The efficiency of both the "in-car" testing and vaccinations have become a model now being used throughout the US. Over 100 individuals comprised of members of the Louisiana National Guard, active and retired physicians, nurses, and medical and nursing students have demonstrated what public service in the face of a pandemic can accomplish.

LSU Health Shreveport has also been on the front line in delivery of virtual vaccine education forums working with churches, sororities, statewide universities and a variety of media outlets. These educational efforts will continue as we work to get every willing member of the north Louisiana community vaccinated.



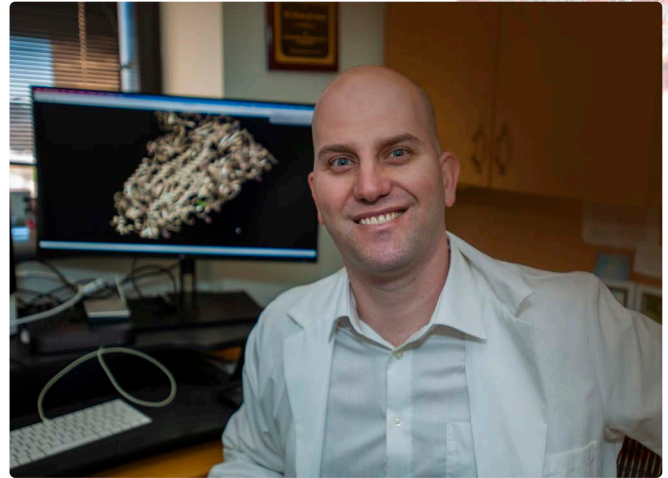
GENOME SEQUENCING by the Center Of Excellence for Emerging Viral Threats (CEVT)

The CEVT is working alongside national and international organizations to make a meaningful impact on the genomic sequencing of COVID-19. Sequencing enables genomic epidemiology work, such as contact tracing, as well as the detection of novel variants. Genetic sequencing data is essential to determining if vaccines are effective against the latest variants currently in circulation. LSU Health Shreveport is one of only a few locations in Louisiana with this capability.

The Center of Excellence for Emerging Viral threats has performed over 2,000 sequences which represents 61% percent of the state's total viruses sequenced as of April 1. Sequencing the entire genomes of viruses and bacteria that cause disease is called "genomic surveillance."

The Center for Emerging Viral Threats was established to favorably position our community's response to the pandemic with genome sequencing playing a key role to response to the pandemic. Sequencing informs scientists of which drugs bacteria have become resistant to, and if vaccines are responsive to specific diseases. By sequencing pathogens, virologists can understand and trace the spread of disease in a highly accurate way. Much akin to how fingerprints or DNA found at a crime scene are the marker of culprit, genome sequencing reveals with great precision which exact lineage of virus is responsible for how an individual was likely infected. For example, if three children come down with a flu virus, sequencing shows if the virus was spread at the school or whether the children caught the virus at their homes. If a virus is spreading within a school, providing that information to the community allows parents and school administrator to make choices about getting vaccinated, wearing masks, or taking other precautions until the threat subsides. Information is power, and the COVID-19 pandemic has taught us that the insights gained from genome sequencing is invaluable and life-saving.

By having a constant stream of data on what "little critters" are causing colds, fevers, and flu's, LSUHS virologists can update vaccines, inform physicians what pathogens are circulating in our communities, and then detect far sooner when the next dangerous influenza or coronavirus erupts.



IDENTIFICATION OF NEW VARIANTS

As the more contagious variants identified originally in the UK and South Africa swept across the US, many feared the impact of viral mutations. Variants of the COVID-19 virus were being identified through genomic surveillance performed by the CEVT. Mutations are typically found on the spike protein, which are arm-like structures protruding from the virus. Sequencing can help slow the spread of the virus because by revealing the geographic origins of the virus and providing insights on how the virus is transmitted throughout communities. As the virus changes, scientists are able to track those changes in order to anticipate where a virus is moving and if it is developing any changes that might allow it to resist vaccines. Thankfully, LSUHS scientists have identified that the current COVID vaccines appear to be very effective at preventing severe disease, even when infections are caused by the latest COVID-19 variants.

Dr. Jeremy Kamil, Associate Professor of Microbiology and Immunology and Director of COVID Genomic Sequencing at LSU Health Shreveport, has been recognized as a leader in sequencing and has served as an outstanding representative of the Institution through innumerable media interviews and podcasts. Major publications throughout the world have sought out Dr. Kamil's crisp and clear explanations on sequencing to include his identification of seven variants of the COVID-19 virus. Working in tandem with a talented data analytics crew, critical reporting and insight has been achieved. The sequencing work by LSUHS faculty has garnered the attention of media outlets such as: The New York Times, Nature, National Public Radio (NPR), BBC Science in Action, Australian Broadcast Channel, CBS Evening News, NBC TV stations in Los Angeles and Connecticut, as well as BBC India and Newsweek magazine.

LSU Health Shreveport **RESEARCH GRANTS**



\$1.2 Million grant for Gross LAB to research 3D Genome Architecture

Dr. David Gross, a professor in the Department of Biochemistry and Molecular Biology at LSU Health Shreveport, has been awarded a 4-year, \$1.2 million grant from the National Institutes of Health for a project entitled “Genome Architecture and Gene Control in Response to Stress.” The goal of Dr. Gross’s project is to understand how the structure and three-dimensional arrangement of stress-responsive ‘HSP’ genes help to protect cells from the damaging, and occasionally lethal effects of exposure to high temperature, chemicals, oxidants or heavy metals.

These aforementioned stresses cause protein misfolding that can diminish or abolish protein function. Protein misfolding is also seen in human diseases such as neurodegeneration and cancer. In neurodegenerative diseases such as Alzheimer’s, Parkinson’s or ALS (Lou Gehrig’s disease), HSP genes are insufficiently activated, leading to neuronal cell degeneration. In cancer, the problem is just the opposite: HSP genes are hyper-activated and thereby enhance the malignancy of tumors.

HSP genes are under the regulation of a DNA-binding protein (transcription factor) termed “Heat Shock Factor 1” (HSF1). The Gross lab has discovered that HSF1 triggers a remarkable genome-wide reorganization of HSP genes when baker’s yeast cells are exposed to acute thermal stress. Such reorganization culminates in the physical clustering of HSP genes into several discrete condensates within the nucleus, much like oil droplets suspended in water. The funded project will delve into how and why this phenomenon takes place.

Insights obtained from this project will inform therapeutic efforts aimed broadly at 3D genome regulation and may suggest novel drugs to treat cancer and neurodegenerative diseases.



Dr. Jain receives \$1.52 million NIH Grant

Dr. Sushil Jain, a Professor in the Department of Pediatrics at LSU Health Shreveport, has been awarded a 3-year, \$1.52 million grant from the National Institutes of Health (NIH) for a project entitled: Optimization of 25-hydroxy-vitamin D levels in African Americans. The goal of the project is the development of a safe, low-cost dietary supplement that can improve the body’s synthesis of Vitamin D and reduce insulin resistance and inflammation. Advances in this research will provide significant benefits in the prevention of pre-diabetes and health disparities within the African American population.

This clinical trial investigates whether the combined use of the micronutrients vitamin D and L-cysteine will exert measurable and beneficial effects on 25-hydroxy vitamin D levels and insulin resistance in African American populations. The long-term goal is to discover new approaches to ensure adequate 25(OH)VD status and to prevent the adverse effects of vitamin D deficiency on health conditions in the African American population.



Dr. Cruz receives \$191,000 supplement to existing COBRE Grant

Diana Cruz, PhD, Assistant Professor, joined the LSUHS Department of Molecular and Cellular Physiology in July 2016. Her current research looks at the interface between the endocrine and cardiovascular systems, emphasizing the effects of stress signaling (glucocorticoid receptors) on cardiovascular health. She has a particular focus in understanding the association between stress, gender/sex, and heart disease risk and outcomes. The traditional and emerging risk factors for heart disease are considered to be the same in men and women. Still, the cardiovascular reactivity to these risk factors differs significantly among sexes. Stress is part of our daily lives, and through years of evolution, our body has developed a sophisticated neuroendocrine response to restore homeostasis in response to stress. However, chronic activation of the stress response leads to

cardiovascular complications, including heart and metabolic disease. Women have an increased sensitivity to mental stress compared to men. However, the molecular mechanisms responsible for women’s increased reactivity to stress and the cardiac outcomes are unknown. She is funded by NIHBL to illuminate the mechanisms underlying females’ increased susceptibility to stress by studying the interactions between the stress hormone receptors and the estrogen receptors in cardiomyocytes and the whole heart in response to ischemia/reperfusion. She is also an integral part of Dr. Christopher Kevil’s COBRE grant—securing a \$191,000 in additional funding—to investigating the effects of stress on the female cardiac redox balance. As we face an unprecedented situation involving social distancing and confinement with the COVID-19 pandemic, recognizing the impact of stress on our cardiac health has become increasingly important. The ultimate goal is to further understand of the female heart to formulate novel therapeutic interventions tailored for women.



STUDENT SPOTLIGHT

Sarahbeth Howes

Sarahbeth Howes uses her blog and Instagram platform—Howes Your Day @sbhoweslife—to share her journey of survivorship, fitness and encouragement. She notes that being able inspire those battling cancer and connecting virtually with other survivors has been a source of healing and support over the years. Since her remission, Howes shares vulnerable insights on how she's managed her path through medical school by training for triathlons, boxing, positive self-talk and meditation.



Self-portrait created in the Arts in Medicine program while receiving treatment at the St. Jude Affiliate Clinic at the Children's Hospital of LSU Health Shreveport

Sarahbeth Howes is a third year medical student, a childhood cancer survivor, a fitness enthusiast, and a tissue donor to the St. Jude Biorepository. Because of her ongoing contribution to the research conducted by the Pediatric Cancer Genome Project (PCGP), scientists are creating breakthroughs in our understanding of the genetic factors that directly influence rare childhood cancers. Howes was one of over 800 patients that donated tissue samples for use in the PCGP; 66% of which came from the St. Jude Biorepository. The tissue bank collects and stores biological samples that allow scientists to conduct new diagnostic tests and therapies that would advance the treatment and increase patient outcomes.

Diagnosed with rhabdomyosarcoma in the soft palate as a sophomore in high school, Sarahbeth had the unique perspective of an adolescent on the cusp of adulthood that also faced with having to make difficult decisions concerning her own mortality. The rare cancer mostly affecting children, forms in the soft tissue of red skeletal muscle. The St. Jude Affiliate Clinic at the Children's Hospital of LSU Health Shreveport is one of eight locations in the country that offer state-of-the-art treatment and innovative clinical trials at no cost to patients. It was because of the location here in Shreveport that Sarahbeth was able to return home. Howes completed 28 weeks of chemotherapy while still continuing her high school classes. At one point in her treatment, she lost her ability to walk which resulted in her being gifted with a walker for her sixteenth birthday. While most of her counterparts were learning how to drive, Sarahbeth was making complex, life-altering decisions on the direction of her treatment plan. She ultimately was responsible with defining her care plan. Howes says of her coming of age as a teenage cancer patient, "Even though [they] are going through cancer, life goes on in the background. For me I was better off at school than I was at home." Recently Howes hit the 10-year survivorship mark, which is a huge milestone in the survivorship community. Through a clinical trial with St. Jude Life, Sarah Beth will be evaluated every 5 years for the rest of her life to document long-term effects of her condition and associated therapies. She had to learn how to cope with the guilt that comes with survivorship and focus on her personal strengths to pull through dark places. Howes is currently completing her medical studies at LSU Health Shreveport with plans of going into oncology. The "cancer survivor turned MD" has a fascination with connecting palliative teams and holistic care plans to provide an expansive world of options to her patients.



The St. Jude Children's Hospital LIFE clinical research trial assesses the long term physical effects of childhood cancer treatment and its impact. Sarahbeth is assessed every five years.



As both a cancer survivor and third year medical student at LSU Health Shreveport, Sarahbeth shared the importance of "food as medicine" during a Feist-Weiller Cancer Center survivorship meeting.

Much like the St. Jude Biorepository, the LSUHS Center for Cardiovascular Disease Sciences Biorepository Unit was established to create an extensive collection of bio-specimens and associated clinical data from ongoing IRB-approved studies. The availability of such samples and data is often integral to different phases of research including: the discovery of altered biochemical pathways or pathological changes, selection of targets for drug development, validation phases of pharmacogenomic/proteomic studies to optimize the efficacy of existing and new drugs, and the development of novel diagnostic/prognostic assays. A parallel collection of blood samples from COVID-19 patients from our local community is submitted to the CCDS Biorepository on an ongoing basis. All Biorepository samples are accessible not only to our own LSUHS researchers, but to researchers around the country who are jointly fighting against cardiovascular disease, and also to investigators studying the COVID-19 pandemic.



Associate Professor, Dr. Changwon Park is a new addition to the Department of Molecular and Cellular Physiology. The major effort of his lab is to decipher the underlying cellular and molecular mechanisms as to the successful generation of the cardiovascular constituents, namely endothelial, endocardium, cardiomyocytes, and hematopoietic cells that share the multipotent cardiovascular progenitors, FLK1 (also known as VEGFR2) expressing cells. Research reveals for the first time that ETV2 (also known as ER71), is a new member of the ETS transcription factor family and is the direct upstream regulator of cardiovascular genes and that ETV2 is indispensable for cardiovascular system development. Subsequently, his lab has shown that the dormant ETV2 in adult endothelial cells is reactivated to trigger the angiogenic program for vascular regeneration and tissue repair upon ischemic injury. Also demonstrated is that ETV2 alone can directly reprogram terminally differentiated non-endothelial cells into functional endothelial cells, inarguably supporting the notion that ETV2 is a highly specific and potent vasculo-angiogenic factor. This research has been supported by multiple major research institutes including NIH R01, AHA, and the March of Dimes Foundation. Dr. Park's findings have been highlighted in leading journals including Cell Stem Cell, Blood, Circulation, Circ. Res., Development, and Arterioscler. Thromb. Vasc. Biol.

Dr. Park joined the faculty April 2020, but already felt strongly about the cutting-edge cardiovascular research of the institution, especially the contributions of both the Department of Molecular and Cellular Physiology and the Center of Excellence for Cardiovascular Diseases and Sciences. Park says, "I am privileged to serve as a member of the faculty senate and enjoy working for the interests of the faculty, students and the campus as a whole to carry out the educational purposes of the university and raise creativity, innovation, and a pioneering spirit of LSU. I am happy to become a part of this community with hospitality and close collaboration and would like to continue my research together with all members to keep the high caliber research and nurturing education environment." Dr. Park has done post-doctoral research and worked as an assistant professor at Washington University School of Medicine, University of Illinois at Chicago and Emory University School of Medicine.

LSUHS Scientists and Researchers Develop Tidal Volume Monitor

New device works to breathe life into emergency situations



A Tidal Volume Monitor project spearheaded by the LSUHS DEVICE group is working to increase the safety and efficacy of emergency ventilation. This collaborative effort was undertaken by Steve Alexander, PhD, Professor of Molecular and Cellular Physiology; Steven Conrad, MD, PhD, MS, MSE, MBA, MSST, MSc, Professor of Medicine, Emergency Medicine, Pediatrics, and Anesthesiology; Ike Muslow Endowed Chair; Giovanni Solitro, PhD, Assistant Professor of Orthopaedic Surgery; and two medical students, Mr. Luke White (MD/PhD candidate) and Mr. Ben Maxey (MD candidate). The DEVICE group produced a simple, inexpensive metronomic flow monitor that provides immediate feedback on a hand-powered ventilation with the purpose of improving oxygenation.

Manual ventilation is a basic skill that involves airway assessment, maneuvers to open the airway, and application of simple and complex airway support devices and effective positive-pressure ventilation using a bag and mask. A bag valve mask, sometimes known by the proprietary name Ambu bag or generically as a manual resuscitator or "self-inflating bag", is a hand-held device commonly used to provide positive pressure ventilation to patients who are not breathing or not breathing adequately.

The Tidal Volume Monitor was created for use in ICUs and other emergency scenarios, public clinics, ambulances and nursing homes where hand ventilation may be done frequently, but incorrectly. Poor ventilation may lead to under oxygenation and over-bagging can cause lung injury.

This device developed by LSUHS scientists and researchers uses a series of sounds and lights to rapidly 'train' operators and emergency responders to more accurately administer hand respiration support for patients that are in transit to a more sophisticated ventilator. The device also prevents injury and ensures that patient does not sustain lung damage from improper use of the flow monitor. This is the latest device from the LSUHSC-S DEVICE group.

NEW EQUIPMENT ADDITIONS

to the Research CORE Facility push scientific research forward

Recently, the Research Core Facility acquired three new pieces of research equipment that are now available to researchers at LSU Health Shreveport. This equipment will enhance biomedical research on campus and help investigators remain competitive when seeking extramural funding.

Agilent Seahorse XFe24 Analyzer

The Agilent Seahorse XFe24 analyzer allows researchers to directly measure energy-producing metabolic activity in live cells. Mitochondria are known as the powerhouses of cells because they produce most of the energy necessary for cell functions and survival. The final steps of breakdown of fuel molecules in mitochondria produce ATP, the energy molecule that is used to power all cell functions, including cell division, cell migration, nutrient uptake, neuron signaling, and synthesis and repair of genetic material. Mitochondrial dysfunction, and thus, dysregulation of cellular energy metabolism, has been linked to a wide variety of human diseases, such as aging, cancer, cardiovascular disease, diabetes, and neurodegeneration. Therefore, having access to the Seahorse XFe24 analyzer to measure energy-producing processes in live cells will allow researchers to better understand disease mechanisms and to test potential therapies for restoring cellular metabolism.



Olympus SpinSR Spinning Disk Confocal Microscope

Fluorescence microscopy is considered an essential basic science research tool, especially when used to monitor fluorescently labeled proteins in live cells. The confocal microscope was developed to enhance the ability to visualize small labeled structures within much larger cells by collecting the fluorescence only from a plane within the cell. The traditional single point scanning fluorescent confocal microscopes are known for their high imaging resolution, however the process of generating the single plane images is relatively slow, which results in phototoxicity (definition) if live cells are used. Researchers in numerous labs at LSUHS need the advanced capabilities of today's confocal microscopes that provide faster image collection, higher resolution and lower phototoxicity. The Olympus SpinSR Spinning Disk Confocal microscope provides these critical advantages by using multiple scanning points and next generation high-speed cameras. This system is ideal for real-time imaging of dynamic changes in living cells. For example, researchers in the LSU Health Shreveport Center for Molecular Tumor Virology study virus entry into and movement within living cells in real time. These critical processes can now be visualized using the new spinning disk confocal microscope.



IncuCyte ZOOM®

The Innovative North Louisiana Experimental Therapeutics program (INLET) is a high-throughput high-content screening (HTS) Core. INLET has two Live-Cell analysis instruments, the Incucyte® ZOOM and Incucyte® S3. Incucyte® Live-Cell Imaging and Analysis approach can monitor cells in real time for days, or even weeks, directly from a cell incubator. Because data is acquired at multiple time points and analyzed in real-time, the Incucyte System replaces the need for multiple plates for various end-point analyses. The image acquisition can be done in HD phase, green fluorescence and red fluorescence, thus enabling non-invasive multiplex analysis. A major advantage of the Incucyte System is that it can acquire six plates at the same time, therefore accommodating multiple users and cell applications. The kinetic image-based applications can profile cell-specific time-dependent biological processes such as: cell proliferation and viability, cell migration, cell invasion and tumor spheroid analysis.



At LSU Health Shreveport the Incucyte System is used in diverse areas of research such as cancer biology, immunology, microbiology, cardiology and in the past year COVID-19 related research. Through the Incucyte System, LSU Health Shreveport laboratories have access to robust and physiologically relevant information with real-time kinetic data. In addition to the custom-made analysis, users can download all data acquired in the Incucyte System including images and movies.

Dr. G. E. Ghali *Speaks at CDC* *Town Hall Session on Equitable Vaccine Access*

The Centers for Disease Control and Prevention organized a virtual National Forum on COVID-19 Vaccine forum that will brought together practitioners from national, state, tribal, local, and territorial levels who are engaged in vaccinating communities across the nation. Dr. G. E. Ghali, Chancellor for LSU Health Shreveport was invited to be one of four panelists on a CDC Town Hall Session on the topic of Building Bridges between Public Health and Healthcare Systems to Ensure Equitable Vaccination. While each panelist was recognized as a VACCINE CHAMPION for their leadership role in vaccine distribution, LSU Health Shreveport was selected to participate in this national conversation based on our engagement of partners at local, regional and state level in an effort to strengthen the COVID-19 response provided by the researchers and physicians at north Louisiana's only academic medical center.



Chris Kevil, PhD

LSU Health Shreveport Faculty **Leads Seminar On COVID-19 Patient Care**

In a collaborative event between LSU Health Shreveport and Louisiana Tech University, Dr. Chris Kevil, Vice Chancellor for Research at LSU Health, Shreveport, and Theresa Sokol, MPH, Acting State Epidemiologist for the Louisiana Department of Health opened the year with New Frontiers in Biomedical Research lectures focused on patient care. On Monday, January 11th Dr. Kevil opened the virtual seminar with a presentation on COVID-19 symptoms that lead to hospitalization, what it is like for patients in the hospital, and what treatment options were available at the time. Dr. Kevil also educated the audience on what a vaccine roll out would look like for Louisiana residents. Sokol followed to share her role as an epidemiologist in the fight against COVID, what she has observed throughout the region, and what a impact a vaccine could mean have on the community. Discussion was moderated by series organizers Dr. Jamie Newman and Dr. Mary Caldorera-Moore, along with Dr. Donna Hood, Associate Dean for Undergraduate Studies in the College of Applied and Natural Sciences and Sam Speed, Dean of Student Engagement.

Focus Fund and MD Anderson launches investment fund **to support promising investigational cancer therapies in early-stage clinical trials**

The Focus Fund GP, LLC in partnership with The University of Texas MD Anderson Cancer Center launched Cancer Focus Fund, LP, an oncology-focused investment fund designed to support compelling investigational cancer therapies in order to advance them from preclinical stages through Phase I and Phase Ib/II clinical trials.

Cancer Focus Fund, LP has achieved its initial goal of \$50 million in committed capital and may raise up to \$75 million. In addition to MD Anderson, limited partners include the Rice University Endowment, the Baton Rouge Area Foundation, LSU Health Shreveport Foundation, Ochsner Health and other private investors.

As part of the partnership, MD Anderson will design and host clinical studies for therapies that receive IND approval, utilizing the extensive expertise of MD Anderson physicians in conducting early-stage clinical trials. LSU Health Shreveport is eager to work with Cancer Focus Fund, LP portfolio companies to provide additional clinical trial sites and patients for clinical studies as appropriate. With clinical trials happening locally, patients will save on travel expenses as well as the stress associated with traveling long distances for treatment.



Keith Scott, MD, NSc, FCCM

Keith Scott, MD, NSc, FCCM, named as the Medical Director for the LSU Health Shreveport Office of Clinical Trial Services. Dr. Scott brings a wealth of knowledge and experience to the position having served as the principal investigator on numerous clinical trials in addition to spending over three decades as a critical care physician. Dr. Scott received his undergraduate degrees in hospital administration at Florida Atlantic University and his medical degree at the University Eugenio Maria De Hostos in Santo Domingo, Dominican Republic. He completed a residency in Internal Medicine at Robert Wood Johnson University Medical School in Trenton, New Jersey and fellowships in Infectious Disease (Albany Medical College) and Critical Care (LSU Health Shreveport).

He earned an additional degree at the University of Edinburg in Scotland in Global Health and Infectious Disease and a Graduate Certificate from the University of North Carolina, Chapel, Hill, NC in Epidemiology.

In this new role, Dr. Scott will provide medical support for all clinical trials conducted by LSU Health Shreveport. He will be instrumental in the design and implementation of investigator-initiated clinical trials, determining feasibility of proposed clinical trials, ensuring that the cost of proposed clinical trials are covered in accordance with federal, state or local law along with providing input in all federal and state audits of clinical research.

Dr. Scott is boarded in Internal Medicine, Internal Medicine-Critical Care, and Neurocritical Care. He is currently the Director of Critical Care Research and a Professor of Pediatrics, Medicine and Surgery.

Cherie-Ann Nathan, MD, FACS, Endowed Professor and Chair of the Department of Otolaryngology-Head and Neck Surgery at LSU Health Shreveport, was elected to serve on the American Board of Otolaryngology – Head and Neck Surgery's (ABOHNS) Board of Directors.

Lester W. Johnson, MD, Vice Chancellor of Academic Affairs and Professor of Surgery in Monroe, was elected Vice President of the Louisiana State Board of Medical Examiners.

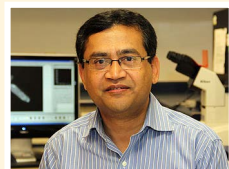
Chris Kevil, PhD, Vice Chancellor for Research at LSU Health Shreveport, was awarded a 4-year NIH R01 grant for \$1.7 million from the National Heart, Lung and Blood Institute for his project, "CSE regulation of vascular remodeling."

LSU Health Shreveport COVID-19 Surveillance Strike Team received the group Patriots of the Pandemic Award presented by the Bossier Chamber of Commerce. Representing the 150 member team were Dr. John Vanchiere, Team Director & Infectious Disease Specialist and 4th year medical student James Robinson. This COVID testing team has been in 44 area nursing homes in coordination with the Region 7 Office of Public Health delivering one of the lowest rates of COVID positivity in the nation. The team also provides testing for jails, prisons, assisted living facilities, schools and migrant farm workers.

Amber N. Edinoff, MD, third year Psychiatry Resident, was awarded the Provost's Outstanding Graduate Medical Education Resident Research Award for her outstanding research contributions. She has worked on over 40 papers within the last year, topics of which include psychiatry, pain, and pharmacology.

Stephen Witt, PhD, was invited for a 2nd 5-year term on the Editorial Board of the Journal of Biological Chemistry. He was also invited to be on the Editorial Board of Aging, Metabolism and Redox Biology as Review Editor for Frontiers in Aging. In addition, Dr. Witt Served on the NIH Fellowship Study Section: Biophysical, Physiological, Pharmacological and Bioengineering Neuroscience (F03B-R (20) L), on October 22-23rd, 2020.

Dr. Mabruka Alfaidi, postdoctoral fellow in Dr. Wayne Orr's laboratory, won the annual British Atherosclerosis Society Young Investigator Award for 2020. The competition is judged by a committee and invited speakers on both the scientific quality and the presentation by the researcher. Dr. Alfaidi is also a finalist for the first annual ATVB Elaine Raines Early Career Investigator Award.



LSUHS Postdoctoral Fellow *nominated for a 2020 Nobel Peace Prize*

Ruhul Abid, MD, PhD, Associate Professor of Surgery at Rhode Island Hospital and Brown Global Health Initiative faculty member was nominated for a 2020 Nobel Peace Prize. Dr. Abid is one of 318 candidates in the world to receive a nomination for his nonprofit organization Health and Education for All (HAEFA).

Dr. Abid, was an LSUHS postdoctoral Fellow in Biochemistry and Molecular Biology, working in Dr. Ricky De Benedetti's lab from 1997-2000. While at LSU Health Shreveport, Dr. Abid worked on a mixed yeast/mammalian cell project that culminated in an important paper that became a landmark at the time on the eukaryotic translation initiation factor eIF4E. After his tenure in the De Benedetti lab, Dr. Abid had a fellowship in Vascular Medicine at Beth Deaconess Medical Center in 2001 and was then hired as an assistant professor at Harvard Medical School. He joined Brown Medical School in 2011 and has established his vascular biology lab at the Cardiovascular Research Center of Rhode Island Hospital. He served on the Medical Faculty Executive Council of Alpert Medical School from 2012-2015. He has been serving as an Executive Faculty Member at Brown Global Health Initiative since 2017.

STATISTICS

Center for Emerging Viral Threats

CENTER OF EXCELLENCE



TOTAL NUMBER OF
PCR Test Samples Processed

312,621

TOTAL NUMBER OF
Vaccines Administered

63,692

TOTAL NUMBER OF
Viruses Sequenced

2,362*

Represents **61% of the sequenced samples in Louisiana*