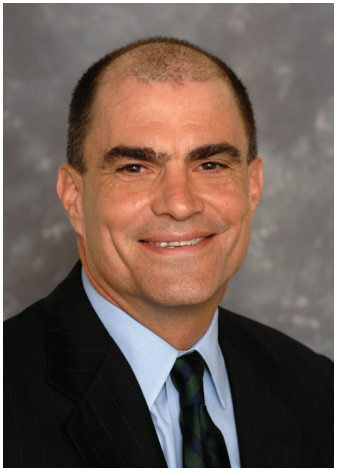
HIGHLIGHTS IN RESEARCH AND CREATIVE ACTIVITIES • 2019–20

MARSHALL


THE
ARTHUR WEISBERG
FAMILY
Marshall University
has been designated an
R2 Doctoral University
High Research Activity
by the
Carnegie Classification of Institutions
of Higher Education
2018

HIGHLIGHTS IN RESEARCH AND CREATIVE ACTIVITIES



Dear Colleagues, Supporters and Friends,

This academic year presented many challenges for Marshall University and the Marshall University Research Corporation.

Through it all, we've risen to the occasion, doing record levels of groundbreaking research while also helping in many ways in the battle against COVID-19. From basic research to finding different and unique ways to help, we played a key role in helping our community deal with the pandemic.

We continue to thrive under the designation as a "Doctoral University: High Research Activity," or R2 university. As the second-highest classification an institution can receive, it's opened doors like we've never seen before.

Our faculty continues its hard work and dedication to education and scholarship. Members of the faculty achieved more external support than ever before in everything from the sciences to the fine and liberal arts, to education and economic development.

I hope you'll enjoy this look back at the year that was in research and creative activities at Marshall University as much as we enjoyed creating it.

Finally, on a somber note, we lost one of our most respected and accomplished scientists, Dr. Zijian Xie, Director of the Marshall Institute for Interdisciplinary Research. His accomplishments inspire us, and we hope to honor his memory as we build on his work.

Thank you for your ongoing support and interest.

Sincerely,

John M. Maher, Ph.D.
Vice President for Research

COLLABORATION FOR RECOVERY

WORKING TOGETHER TO COMBAT ADDICTION. The Marshall University Center of Excellence for Recovery was awarded a nearly $1.5 million federal grant from the Substance Abuse and Mental Health Services Administration.

The plan? To develop and empower a pipeline of diverse student leaders who are ready to collaborate with their campuses and communities around the state, addressing substance misuse issues.

The grant creates a partnership, Collegiate Partnerships for Success, among the Center of Excellence for Recovery at Marshall with the Alliance for the Economic Development of Southern West Virginia, Prevention Lead Organizations and state agencies, local organizations and coalitions.

The five-year initiative is focused on preventing the onset and reducing the progression of substance misuse among young adults. It will help to develop connections between higher education institutions and local prevention coalitions.

"This grant comes at a time when prevention is needed more than ever for young adults in Southern West Virginia with the stresses of the pandemic on top of the normal stresses of transitioning to the responsibilities of adulthood."

DR. TAMMY COLLINS
Center of Excellence for Recovery

"Education and entrepreneurship are the great equalizers of opportunity that ignite economic growth, connecting job readiness with job creation. Tricia's experience in economic development and her leadership role in the iCenter will serve as a valuable resource to the entrepreneurs who will benefit from the services the incubator provides."

BRAD D. SMITH
Chairman of the INTUIT Board / Marshall University Benefactor

BRAD D. SMITH INCUBATOR WELCOMES NEW LEADERSHIP

A NEW FACE OF ENTREPRENEURISM. The Marshall University Brad D. Smith Business Incubator has a new leader. Tricia Ball will lead the Business Incubator on an interim basis, helping new entrepreneurs find their way.

Ball currently serves as the associate director of the Marshall University Center for Entrepreneurship and Business Innovation, known as the iCenter. It's housed in the Lewis College of Business and Brad D. Smith Schools of Business. The goal: to help Marshall University students start their own businesses. Ball's connection with both the iCenter and the Incubator creates a seamless connection for the next generation of small business owners and inventors.

Ball was recently selected as one of 40 fellows from 13 states for the inaugural class of the Appalachian Regional Commission's Appalachian Leadership Institute. She's the only representative from the state of West Virginia.

Tenants are currently being accepted for the Brad D. Smith Business Incubator.
For more information e-mail ballt@marshall.edu.

MASK ARMY STARTS AT MARSHALL

AN ARMY OF PEOPLE PROVIDE HELP TO THOSE ON THE FRONT LINE.

Dr. Suzanne Strait, who has taught thousands of West Virginia's health care workers in her anatomy class in the College of Science, spearheaded an effort to rapidly produce surgical masks made from high-end furnace filters.

She teamed up with former students Patricia Rogers and Dr. Rose Ayoob, as well as Dr. Hilary Brewster from Marshall's Department of English, and organized a team to work separately and sew masks for local hospitals in need.

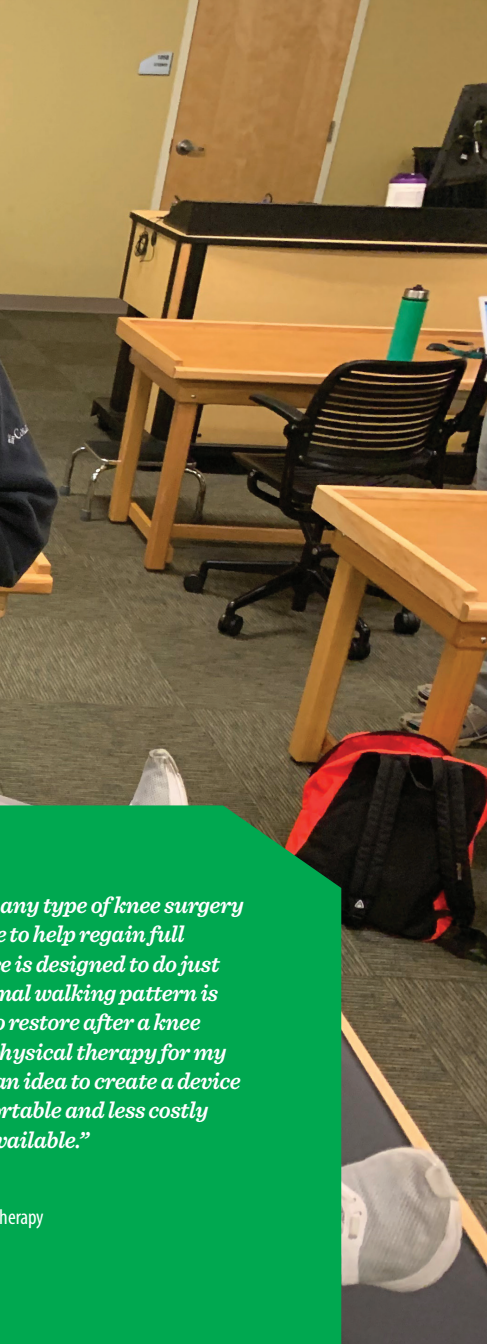
They organized a website at **www.westvirginiamaskarmy.com** and a Facebook page at "West Virginia Mask Army."

"Many of our health professionals are about to put their lives on the line without proper personal protective gear. We have designed masks with doctors that will be more effective than the cotton mask."

DR. SUZANNE STRAIT
Anatomy Professor

"Most everyone that has will need an outside force extension, and this devic that. Returning to a norm often the hardest thing to surgery. While I was in p own knee surgery, I had a that would be smaller, po than what is currently av

DR. BRAD PROFITT
Assistant Professor, School of Physical T



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FACULTY MEMBER FLOURISHES AS INVENTOR

INVENTING STABILITY. Dr. Brad Profitt, assistant professor in the Marshall University School of Physical Therapy, took part in the University of Louisville's LaunchIt program. Through the Marshall University Research Corporation's partnership in the Southeast XLerator Network, Profitt was provided a great opportunity.

Profitt has developed a therapeutic device used to regain knee extension after an injury or surgery. He has worked closely with the Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI) on the extender.

LaunchIt is a 10-week program developed to help entrepreneurs and researchers gain a better understanding of the process for evaluating the commercial potential of their innovations and how to bring them to market.

Profitt said he wanted to design a device that would allow him to regain full extension of his knee and normalize his walking quickly and correctly after his own surgery.

PROVIDING ECONOMIC HELP DURING A PANDEMIC

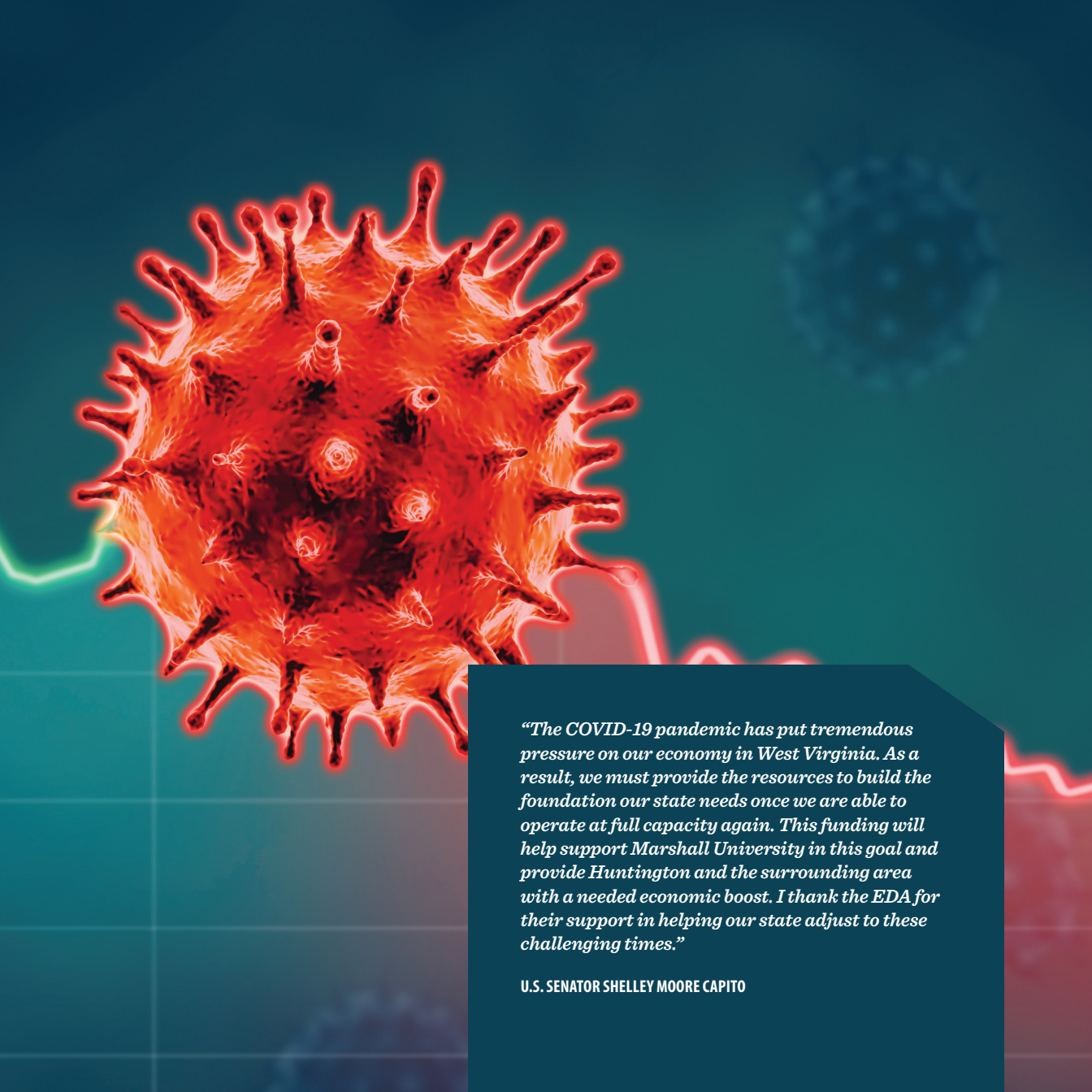
REGIONAL ECONOMIC DEVELOPMENT DURING AN OUTBREAK.

The Robert C. Byrd Institute (RCBI) was awarded $300,000 by the U.S. Economic Development Administration (EDA) to boost its capacity to support regional economic development in response to the COVID-19 pandemic.

RCBI's EDA University Center will use the CARES Act Recovery Assistance funding to assist small and mid-size manufacturers and entrepreneurs statewide in their COVID-based business responses.

The support targeted business pivots and modifications through access to emerging technology. The EDA University Center leverages the resources of the university to spur economic development in the region.

The EDA funds allowed RCBI to add additional resources that include a design engineering position to assist specifically with prototyping and small-batch manufacturing.

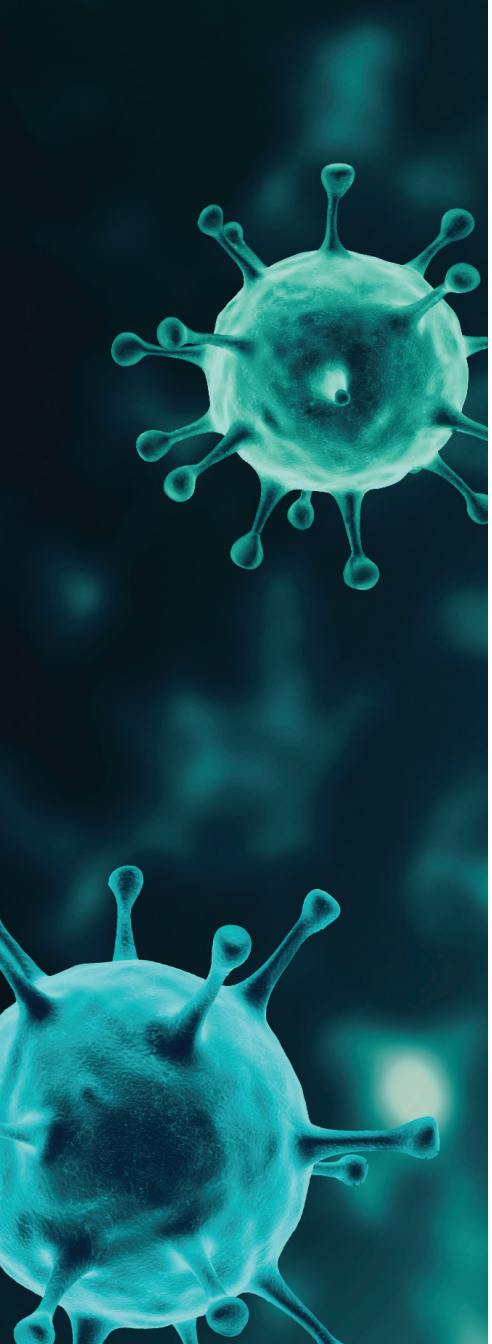


"The COVID-19 pandemic has put tremendous pressure on our economy in West Virginia. As a result, we must provide the resources to build the foundation our state needs once we are able to operate at full capacity again. This funding will help support Marshall University in this goal and provide Huntington and the surrounding area with a needed economic boost. I thank the EDA for their support in helping our state adjust to these challenging times."

U.S. SENATOR SHELLEY MOORE CAPITO

"The COVID-19 pandemic has been a sobering reminder that infectious diseases continue to be a major public health threat and require sustained research commitment. While this is a small study that only addresses the potential for fomite (an object that may be contaminated with infectious agents) transmissions, which is thought to be less important than droplet transmission for SARS-CoV-2, it nevertheless is informative for public health risk assessment."

JEREMIAH MATSON
Marshall University Researcher



ENVIRONMENT FOUND TO AFFECT STABILITY OF COVID

STABILITY OF COVID-19 AFFECTED BY ENVIRONMENT. A study led by Marshall University Researcher M. Jeremiah Matson found that environmental conditions affect the stability of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in human nasal mucus and sputum.

Matson, the lead author on a study in Emerging Infectious Diseases, the journal of the Centers for Disease Control and Prevention (CDC), is a student in the combined Doctor of Medicine and Doctor of Philosophy in Biomedical Research program at the Marshall University Joan C. Edwards School of Medicine.

SARS-CoV-2, the virus that causes the disease known as COVID-19, was found to be less stable at higher humidity and warmer temperatures. In the study, SARS-CoV-2 was mixed with human nasal mucus and sputum specimens, which were then exposed to three different sets of temperature and humidity for up to seven days.

Samples were collected throughout the study and analyzed for the presence of infectious virus as well as viral RNA alone, which is not infectious. Viral RNA was consistently detectable throughout the seven-day study, while infectious virus was detectable for up to approximately 12-48 hours, depending on the environmental conditions.

TELLING THE UNTOLD STORIES

TELLING STORIES THROUGH SOUND. Marshall journalism professor Dan Hollis and WMUL-FM, Marshall's public radio station, were honored with a Regional Edward R. Murrow Award for the third time in the past four years by the Radio Television Digital News Association.

Hollis and WMUL-FM received the award in the "Excellence in Sound" category for small market radio stations in Region 8. The category was open to radio stations in Kentucky, North Carolina, South Carolina, Tennessee and West Virginia.

The piece that won, "Softball Sounds like a Fun Sport," profiled the atmosphere inside the Marshall softball team's dugout. The story aired on the 5 p.m. edition of Newscenter 88.

EDWARD R. MURROW AWARDS 2020

"Telling stories through sound provides the mind's eye with a different way of experiencing a unique atmosphere. I want to thank Coach Smith and the entire team for granting me incredible access. What a great team and great asset to the university. I think the story captures its camaraderie, spirit and drive."

DAN HOLLIS
Marshall Journalism Professor

"As soon as we heard about the PPE shortage, my fiancée Elizabeth Basham and I started trying to find ways to help. She started sewing masks, and I started researching 3-D printed solutions."

JOHN TAYLOR
Instructional Technologist at the School of Pharmacy

PROTECTION DURING THE COVID ERA

USING THEIR SKILLS TO HELP DURING A PANDEMIC. Information technology staff at the Marshall University School of Pharmacy and Joan C. Edwards School of Medicine lent their expertise to personal protection equipment (PPE) production.

More than 100 face shields were produced using 3-D printers, including one personally owned by staff and one at the School of Medicine usually dedicated to 3-D printing of anatomy for student training. The face shields have been provided to the St. Mary's Medical Center.

That masks consist of a 3-D printed plastic headband and a piece of transparency film, which can be purchased at an office supply store, attached as the face shield. They were produced following National Institutes of Health guidelines.

Marshall Health donated the materials for printing the first batch of 3-D headbands.

DR. KOMAL SODHI

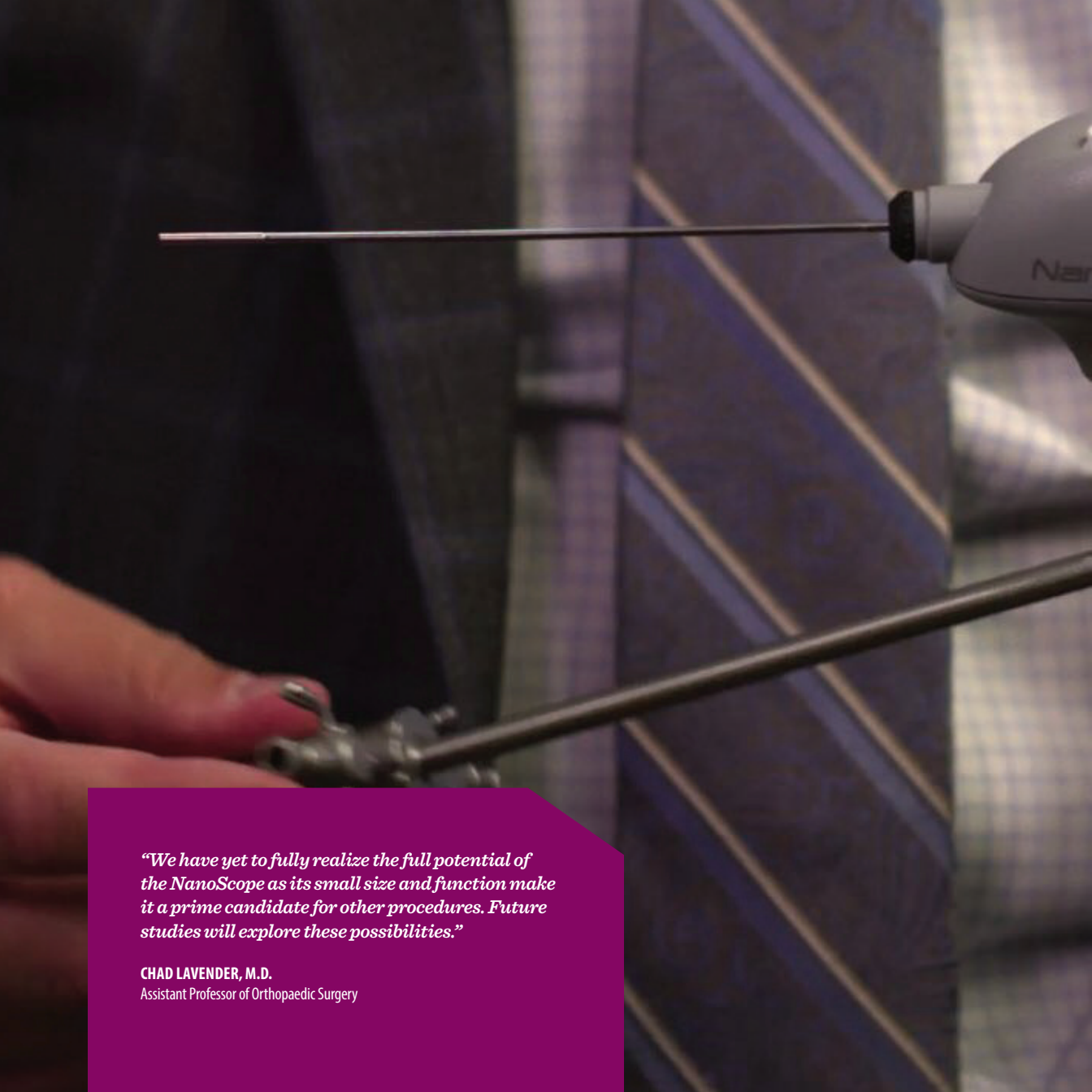
CARDIOMYOPATHY AND RENAL FAILURE. Komal Sodhi, M.D., an associate professor of Surgery and Biomedical Sciences in the Joan C. Edwards School of Medicine, was awarded a $444,000 grant from the National Institutes of Health (NIH), to further her research on cardiomyopathy associated with chronic renal failure, uremic cardiomyopathy.

The three-year NIH Research Enhancement Award (R15) will allow Sodhi to further examine more about the activation of sodium pump, or Na/K-ATPase, signaling specifically in fat cells known as adipocytes.

Sodhi will use experimental renal failure mouse models and simulate oxidative stress through a high-fat diet. The peptide will be specifically targeted to the fat cells, which will work to treat and prevent the development of uremic cardiomyopathy.

"This research provides an important breakthrough with translational application and demonstrates that the Na/K-ATPase oxidant-amplification loop and/or adipocytes are potential targets for disease intervention."

KOMAL SODHI, M.D.
Associate Professor of Surgery and Biomedical Sciences at the Marshall University Joan C. Edwards School of Medicine



"We have yet to fully realize the full potential of the NanoScope as its small size and function make it a prime candidate for other procedures. Future studies will explore these possibilities."

CHAD LAVENDER, M.D.
Assistant Professor of Orthopaedic Surgery

SCHOOL OF MEDICINE EXPLORES NEW SURGERY TECHNIQUE

SCHOOL OF MEDICINE ON THE CUTTING EDGE. Through the use of a newly developed needle arthroscope, incisionless and single-incision surgical procedures are possible for repairing certain types of knee and shoulder injuries. These assertions were published in Arthroscopy Techniques, a companion to Arthroscopy: The Journal of Arthroscopic and Related Surgery.

Arthroscopy is a procedure used to diagnose and treat joint problems through the use of an arthroscope, a narrow tube with a fiber-optic camera attached. A surgeon inserts this tube through a small incision to gather images and determine next steps. Repairs can sometimes be made during the procedure.

Similar to traditional arthroscopes, the NanoScope needle arthroscopy system, developed by Arthrex, is both diagnostic and therapeutic. In the Arthroscopy Techniques articles, Chad D. Lavender, M.D., lead author and assistant professor of Orthopaedic Surgery at the Marshall University Joan C. Edwards School of Medicine, and his team used the NanoScope to perform three types of repair procedures. Two procedures were in the shoulder – a single-incision rotator cuff and a single-incision anterior labrum repair – and one was in the knee – an incisionless partial medial meniscectomy.

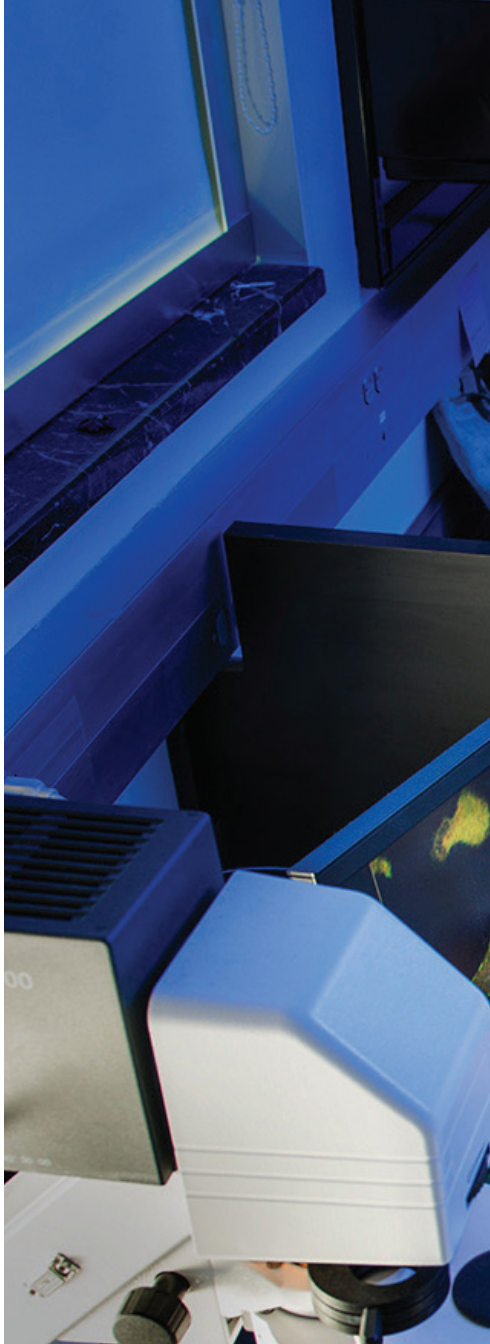
REMEMBERING ZIJIAN XIE

A PIONEER IN RESEARCH. Zijian Xie, Ph.D., served as director of the Marshall Institute for Interdisciplinary Research (MIIR) and professor at the Joan C. Edwards School of Medicine.

Named director of MIIR in 2013, he was known internationally for his groundbreaking work to understand the behavior of cellular pathways and their relationship to cancer, renal disease and cardiac failure.

He came to Marshall from the faculty of the University of Toledo's College of Medicine, where he was a professor of physiology, pharmacology and medicine and served as the co-director of the M.D./Ph.D. program.

At the time of his passing, he had authored or co-authored over 100 peer-reviewed manuscripts and book chapters. Dr. Xie passed away January 17, 2020, following a long illness.

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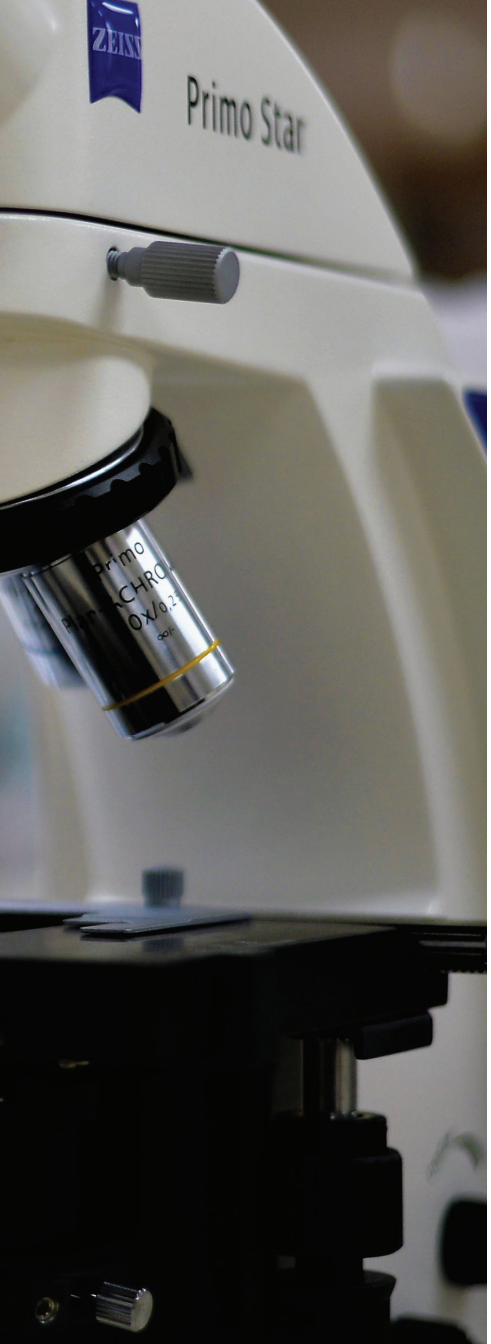

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