

West Virginia State University
Receives funding to expand
watermelon research

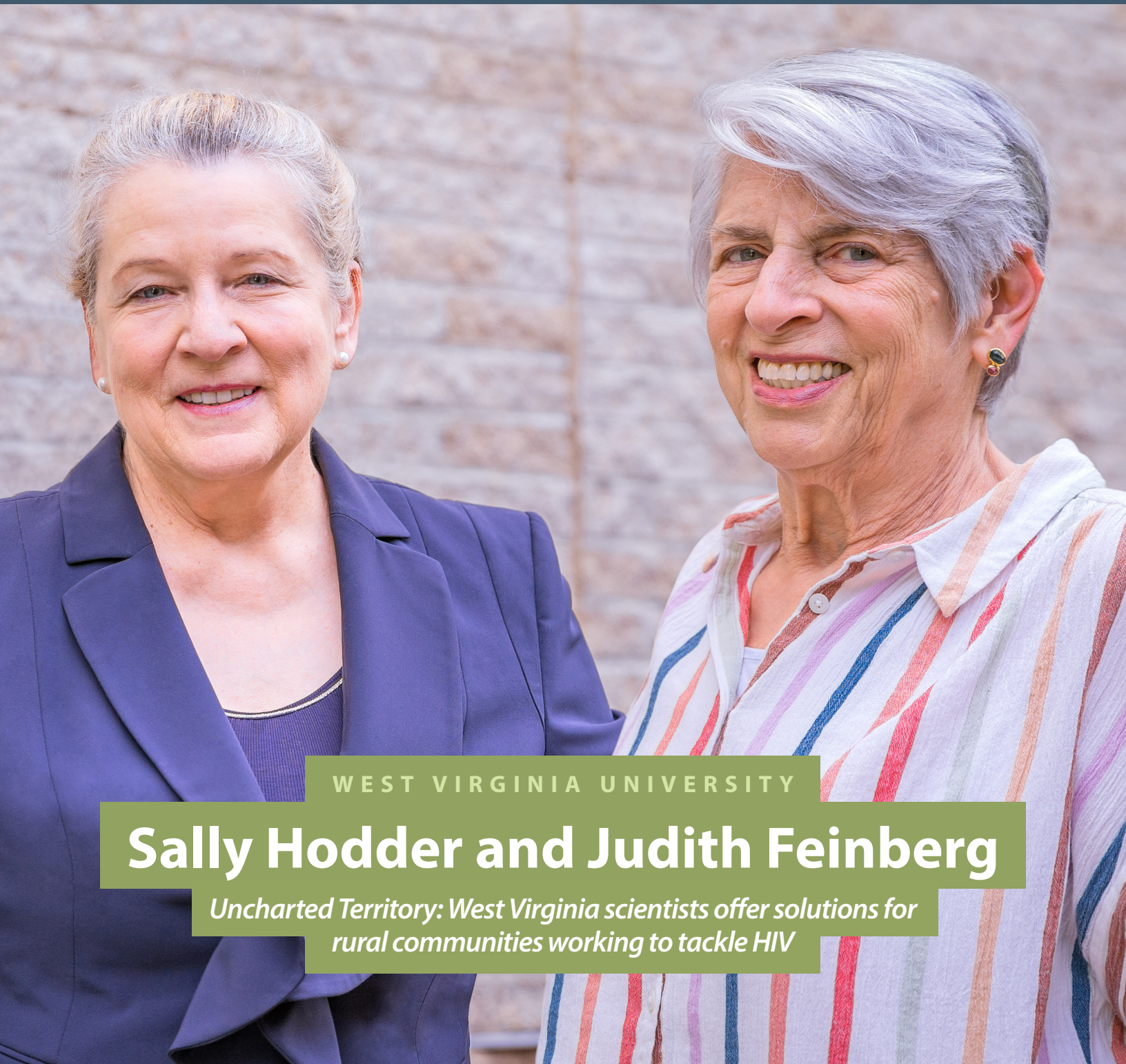
Marshall University
NIH awards professor \$1.8 million for
nicotine addiction research

WVU Tech
SUCCESS program helps students
through NSF grant

NEURON

SPRING 2021

West Virginia's Journal of Science and Research



WEST VIRGINIA UNIVERSITY

Sally Hodder and Judith Feinberg

*Uncharted Territory: West Virginia scientists offer solutions for
rural communities working to tackle HIV*

West Virginia wants to attract the high-tech employers and federal research dollars needed to diversify its economy. *But how?*



Vision 2025: West Virginia Science & Technology Plan

Read more about the strategic goals set in this plan at wvresearch.org.



SPRING 2021

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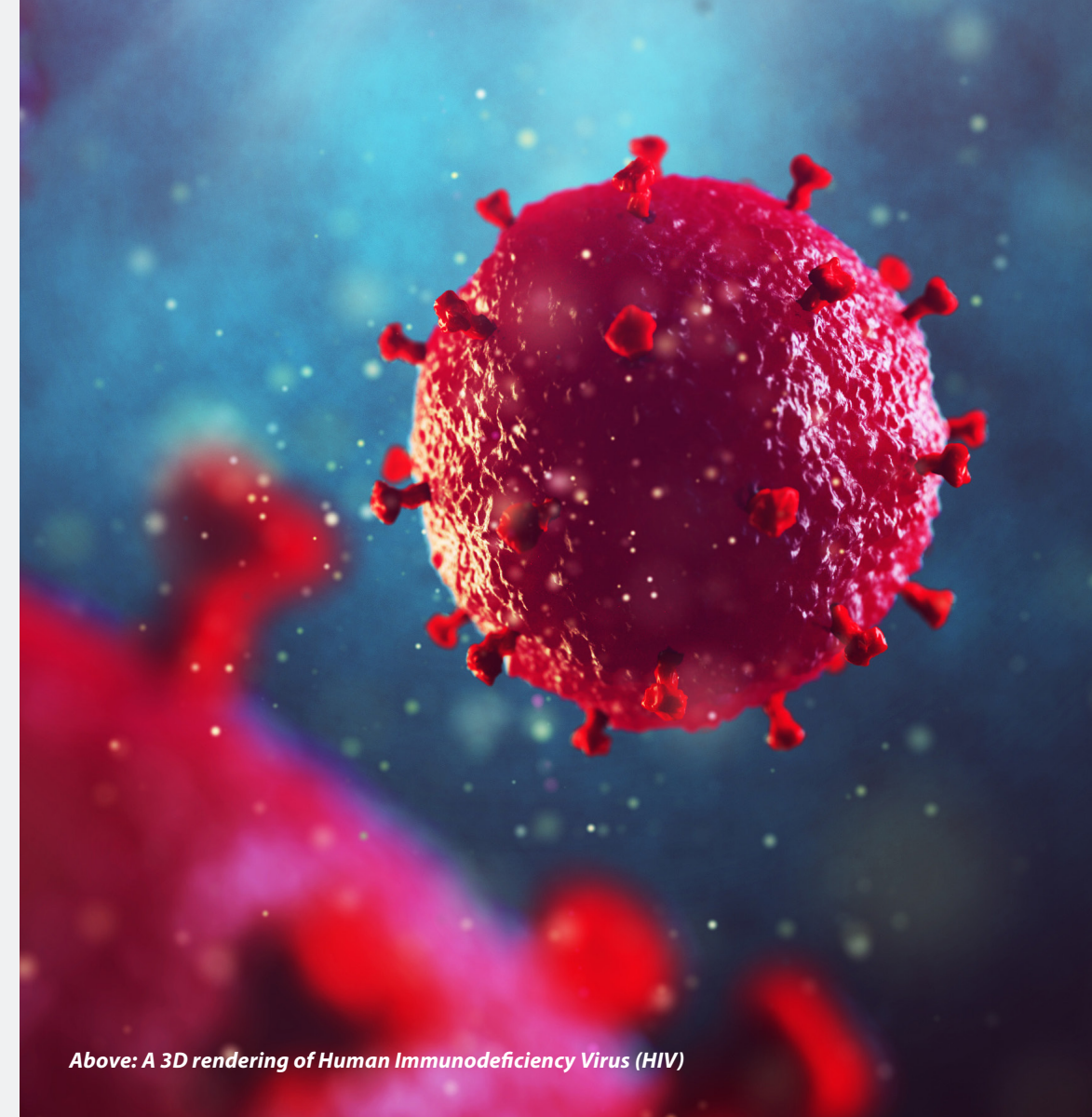
ABOUT

West Virginia Science & Research, a division of the West Virginia Higher Education Policy Commission, provides strategic leadership for the development of competitive academic research opportunities in science, technology, engineering and mathematics. The office directs the National Science Foundation's Established Program to Stimulate Competitive Research (EPSCoR) in West Virginia, coordinates scientific research grants to academic institutions from federal and state agencies, and conducts outreach activities to broaden the public's understanding of science.

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Above: A 3D rendering of Human Immunodeficiency Virus (HIV)

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Moving Mountains: WVU engineers lead project to reclaim mine refuse site in West Virginia

A 10-year research project to restore a 40-acre abandoned mine refuse site nestled atop the mountains of Greenbrier County is in its final stages of development thanks to the work of civil engineers at West Virginia University, local and state government organizations and industry partners.

The ambitious project led by Associate Professors John Quaranta and Leslie Hopkinson in the Wadsworth Department of Civil and Environmental Engineering in the Statler College of Engineering and Mineral Resources, and Paul Ziemkiewicz, director of the West Virginia Water Research Institute, a program of WVU's Energy Institute, utilizes a reclamation technique called Geomorphic Landform Design to mitigate acid mine drainage originating from the waste pile.

The acid mine drainage generated from the site has been costing the state of West Virginia nearly a quarter of a million dollars to treat each year, the researchers said.

Quaranta explained the philosophy

behind GLD is to balance the erosive and resistive forces of the site in order to recontour the land as nature would have created the environment. Landforms are designed, in part, to mimic the natural landscape.

"This site is unique because it's on a mountain top," Quaranta said. "Coal refuse was hauled in, which contained pyritic materials, and when it mixed with the rainwater infiltration, it generated acid mine drainage."

Quaranta added that because the Royal Scot mine site had been previously surface mined and stacked with refuse, it was challenging to control the groundwater flow, opening up multiple pathways for rainwater to infiltrate and escape out of the pile and contaminate nearby waterways.

After approximately five years of studying the topography of West Virginia and visiting countless state parks with the assistance of numerous undergraduate and graduate students, the researchers were able to identify Appalachian landforms to produce a new terrain design using computer modeling for the decommissioned refuse site to minimize precipitation infiltration and centralize the surface flow of water into controlled channels to reduce acid mine drainage production inside the refuse pile.

The researchers explained that because of the rough and mountainous terrain in central Appalachia, this technique has not yet been widely implemented in eastern coal-producing regions but has been successful in other parts of the world.



New science and technology plan seeks to attract federal dollars and high-tech industry

If West Virginia wants to attract the high-tech employers and federal research dollars it needs to diversify its economy, then the state must develop its science, technology, engineering and math (STEM) talent pipeline, expand the efforts of its research universities, encourage innovation, and help small businesses and high-tech companies grow. Those are the goals set out in **Vision 2025: West Virginia Science & Technology Plan** (S&T Plan), the strategic plan for science and research that was released by the West Virginia Higher Education Policy Commission.

Read the full plan now on our website at wvresearch.org.

FROM THE DIRECTOR: Juliana Serafin

New science and technology plan seeks to attract federal dollars and high-tech industry



How can West Virginia attract the high-tech employers and federal research dollars it needs to diversify its economy? Our Science & Technology Plan addresses just that.

Vision 2025: West Virginia Science & Technology Plan (S&T Plan) builds upon several existing initiatives among higher education, industry and government. It also proposes new activities in the pipeline – including a pilot voucher program that incentivizes research collaborations among West Virginia companies and higher education institutions, along with new opportunities that make the state's colleges and universities more competitive for larger federal grants. The state must further develop its

science, technology, engineering and mathematics (STEM) talent and expand the efforts of its research universities while helping small businesses grow.

The plan focuses on high-priority platforms that represent growing university-based research and educational activities, and are aligned with West Virginia's target industries and workforce goals: Life Sciences, Computer and Data Science, Advanced Manufacturing, and Advanced Energy.

The full plan can be found on our website at wvresearch.org. I encourage you to read it.

I also hope you find this issue informative. Our feature article highlighting the differences between barriers to HIV treatment in urban versus rural settings is timely. We also highlight recent grant awardees at our institutions as well as innovative research happening throughout the state.

Juliana Serafin, Ph.D.

Senior Director of Science & Research, West Virginia Higher Education Policy Commission, and Project Director, WV EPSCoR

Photo courtesy of University of Charleston

The Science & Research Council was established by the West Virginia Legislature in 2009. The goal of the Science and Research Council is to increase the capacity of the state and its colleges and universities to attract, implement and use cutting-edge, competitive research funds and infrastructure. Members provide expertise and policy guidance regarding federal and state programs including EPSCoR, the Research Challenge Fund, and the former Research Trust Fund. Representatives of government, industry, business and academia make up the council.

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Uncharted Territory: West Virginia scientists offer solutions for rural communities working to tackle HIV

Effective treatment requires a different approach in a state already troubled by the opioid epidemic

Written by **Angela Sundstrom**
Headshots courtesy of **West Virginia University**

With the opioid epidemic negatively impacting public health both across the country and in West Virginia, and Human Immunodeficiency Virus (HIV) presenting additional challenges in already vulnerable communities, two West Virginia experts are offering a rural perspective on how to better respond to these crises.

Sally Hodder, M.D., associate vice president for clinical and translational science at West Virginia University, director of the West Virginia Clinical and Translational Science Institute, and professor of medicine/infectious diseases, served as lead author for "The opioid crisis and HIV in the USA: deadly synergies," the fifth installment in a six-paper series from The Lancet - an independent, international general medical journal - that presents a path towards eliminating HIV in the USA.

Judith Feinberg, M.D., vice chair of medicine for research and professor of both medicine/infectious

diseases and behavioral medicine and psychiatry at West Virginia University, co-authored the paper with Hodder and five additional experts from outside institutions. Hodder and Feinberg are uniquely positioned to address this work since both were on the frontlines as HIV emerged in the 1980s.

"I saw HIV before we knew it was HIV," Hodder said. Hodder's early career years were spent in California and the Coast Province in Kenya. Feinberg also spent time in California, as well as at the National Institutes of Health (NIH) in Maryland and 20 years in Cincinnati, OH. It was there, in 2005, she noticed an unusually high number of endocarditis cases, a life-threatening heart infection that can be a signal of injecting drugs.

"I realized that we had a new injection drug problem," Feinberg said.



Feinberg



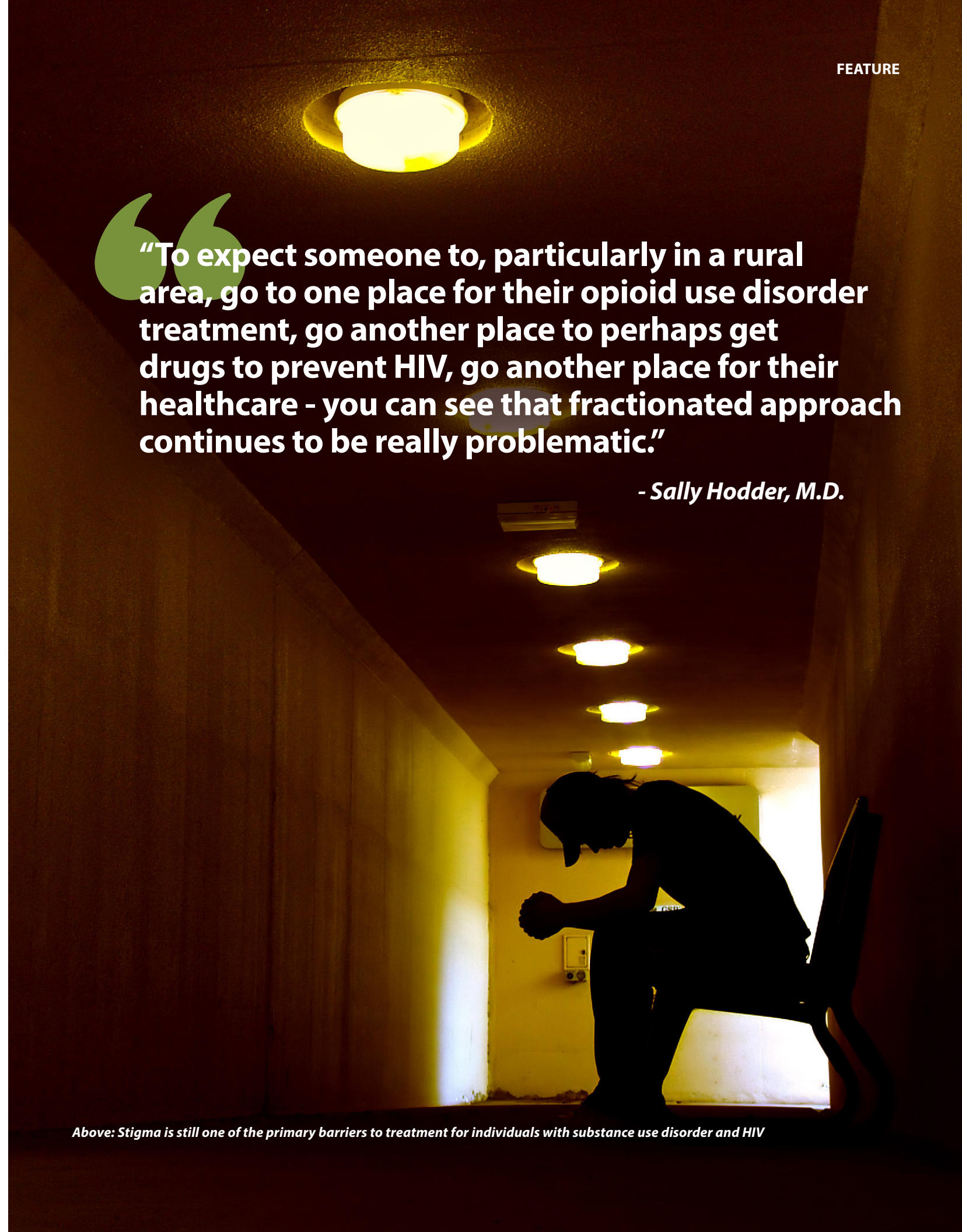
Hodder

Photos courtesy of West Virginia University

"To expect someone to, particularly in a rural area, go to one place for their opioid use disorder treatment, go another place to perhaps get drugs to prevent HIV, go another place for their healthcare - you can see that fractionated approach continues to be really problematic."

- Sally Hodder, M.D.

Above: Stigma is still one of the primary barriers to treatment for individuals with substance use disorder and HIV



Neuroscience of addiction

Everyone experiences pleasure thanks to the reward circuits in our brains. These pathways trip neurotransmitters, tiny chemical messengers communicating between neurons, that offer a sense of contentment. They also encourage repeat behavior. Drug use affects these same pathways, and constant stimulation results in these abnormal behavioral responses. The outcome is substance use disorder.

“This is a chronic relapsing brain disease and, as a brain disease, the constant triggering of these pathways disturbs thinking about the consequences of things,” Feinberg said. Drug use leads to chemical and physiological changes in the brain, Feinberg said. For example, a researcher can give the same stimulus to two different people: one with substance use disorder and one without. A functional MRI scan will light up as different patterns, a signal that their brains are functioning differently.

“Drugs that result in substance use disorders are all drugs that affect neurotransmitters - these little molecules that move from one neuron to the other to facilitate function, behavior, responses,” Feinberg said. “We all have these pathways and what happens with substances of abuse is that they goof up those signals.”

People who develop substance use disorder might experience the recover-relapse-recover-relapse cycle multiple times before attaining and maintaining sobriety, Feinberg said. She chooses to describe it as “a hostile takeover of the brain.”

“Punitive things really don’t work. Kindness, acceptance, empathy, support. That works.”

- Judith Feinberg, M.D.

The rural difference

Small mountain communities are generally unaccustomed to HIV outbreaks as the disease was historically viewed as an urban problem. That was before the current opioid epidemic.

Over the last two decades, the demographics of injection



Above: Geography is one barrier that challenges treatment access in rural states like West Virginia. Individuals with HIV or substance use disorder can find it difficult to reach health services without additional support.

drug use have shifted. The Lancet series article states that by 2015, many people who injected drugs and were also newly diagnosed with HIV had three things in common: they were predominantly white, younger than 35 years old and residing outside metropolitan areas. Many in already vulnerable rural communities felt underequipped to address the issue.

Hodder emphasized there is now a better understanding that rural communities need different responses. The solutions working in New York City might not be best in West Virginia. For example, providing a bus voucher for individuals to reach a clinic will not work when there is limited or no bus service. She stresses the importance of integrated care.

“To expect someone to, particularly in a rural area, go to one place for their opioid use disorder treatment, go another place to perhaps get drugs to prevent HIV, go another place for their healthcare - you can see that fractionated approach continues to be really problematic,” Hodder said.

Key messages for reducing and understanding HIV in rural communities

EVOLVING USERS

Demographics of new HIV diagnoses among people who inject drugs in the USA are changing, with white people having the highest proportion of new diagnoses

MORE WOMEN

Women who inject drugs have a higher risk of HIV acquisition than men who inject drugs

BARRIERS PERSIST

Numerous barriers prevent effective implementation of evidence-based strategies

REDUCE STIGMA

Accessibility of HIV prevention and substance use treatment will only occur if stigma is addressed and insurance coverage extended

OVERALL CARE

One-stop-shop care that addresses the needs of the individual in a comprehensive, efficient, and non-judgmental manner is crucial not only to HIV prevention but also to health outcomes

ADDRESS ROOT CAUSES

Lasting solutions need to include identifying and addressing the root causes of opioid use disorder



From The Lancet. The opioid crisis and HIV in the USA: deadly synergies. Series: HIV in the USA. Volume 397. Issue 10279. P1139-1150, March 20, 2021.

Poverty and income inequality play into overdose death rates and HIV acquired through injection drug use. According to the U.S. Census, about 16 percent of West Virginians live in poverty. Gender differences are also common. Women are 1-2 times more likely to contract HIV from injection drug use, often being second to use the needle after their male injection partner.

Having more specific geographic data related to these issues could help properly address problems. Many prestigious HIV and AIDS research centers are in cities

so, Hodder says, continuing to identify and fund more localized solutions could provide valuable information.

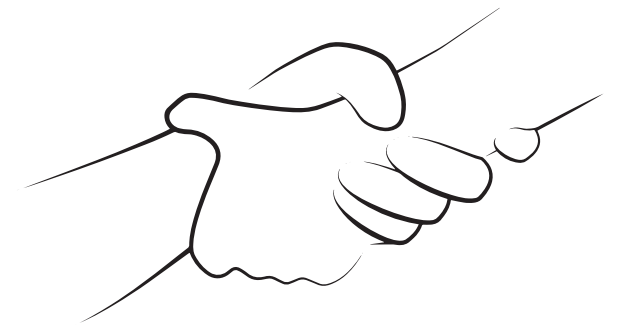
Solutions to an unprecedented crisis

The rural HIV and injection drug use problems are complex. Both Feinberg and Hodder emphasize the importance of evidence-based policies including HIV prevention practices and one-stop-shop care. This means providing better access to transportation, empowering local primary care facilities to provide care for substance use disorder and HIV, removing health insurance barriers, providing community-based intervention with trusted leaders, increasing research related to injection drug use and helping to restore an individual’s sense of purpose.

They also encourage an increased sense of empathy for those living with HIV, especially in a state still learning how to best address this new crisis. Stigma is still one of the greatest barriers to care.

Feinberg likes to invoke a parable about the sun and the wind. Which one can convince a man to take off his overcoat first? The forceful wind blows and blows, but the man only wraps his coat tighter and tighter around him. The sun, instead, shines brightly and provides comfort. The man is appreciative of the warmth, so he eagerly removes his coat and decides to stay. She believes the same approach can be used to reach marginalized individuals diagnosed with HIV in order to get them the care they need.

“In life, that’s how things work,” Feinberg said. “Punitive things really don’t work. Kindness, acceptance, empathy, support. That works.”



WVU Tech SUCCESS program helps students through NSF grant

By Zachary Carrier

New students pursuing computer engineering, computer science, electrical engineering or information systems at West Virginia University Institute of Technology (WVU Tech) can now do so with help from a \$650,000 National Science Foundation grant.

The five-year Supporting Undergraduate Cohorts of Career-Ready Engineering and Science Scholars (SUCCESS) program offers specialized student support in academics, funding to send students to conferences and competitions, practical undergraduate research experiences, career exploration and scholarships of up to \$10,000.

“Students in the SUCCESS program will have opportunities designed specifically to help them learn better, progress through their studies easier and, ultimately, find greater success in applying their training to a career,” said **Kenan Hatipoglu, Ph.D.**, associate professor of electrical engineering and SUCCESS co-organizer.

Sanish Rai, Ph.D., assistant professor of computer science and SUCCESS co-organizer, said the cohort-based initiative is about early networking.

“The students in this program will share in these common experiences and will build a community within the greater student community here at WVU Tech,” he said.

Students must be admitted for Fall 2021 and demonstrate financial need by completing the FAFSA.

West Virginia State University receives funding to expand watermelon research

By Matt Browning

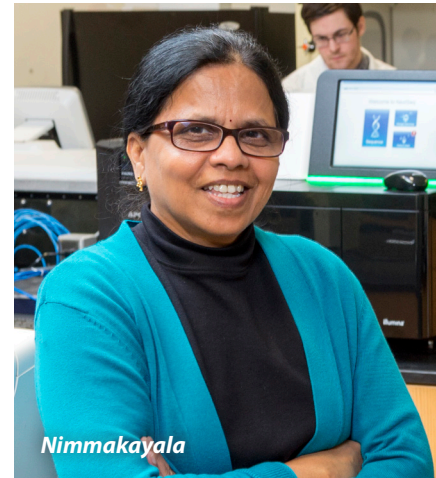
West Virginia State University (WVSU) received a \$599,679 grant from the United States Department of Agriculture (USDA) to expand research that develops rootstocks for watermelon crops.

“We hope to enhance resiliency and marketing opportunities for watermelon growers both in West Virginia and the U.S. by launching grafting techniques that will optimize returns on investment and address the stress factors that affect plants,” said **Padma Nimmakayala, Ph.D.**, the lead scientist on the project.

The purpose of the project is to track and understand molecular changes happening in watermelon while grafted to wild watermelon species. This work will enhance the knowledge of the genes moving from one plant that is used as rootstock to the watermelon which is used as a scion, and vice versa.

“This funding will help us to identify effective robust watermelon rootstock alternatives to the currently used calabash and pumpkin,” Nimmakayala said. The goal is to reduce soil-borne diseases and pests while maintaining or enhancing watermelon yield and quality.

This work will utilize various African endemic wild watermelon species for grafting to create stronger rootstocks. Grafting involves uniting two living plant parts so that they grow as a single plant. The team



Nimmakayala

will graft Charleston Grey and other popular watermelons to rootstocks of wild species and analyze the results in terms of strength, disease-resistance and overall fruit quality.

The interest in grafting as a means of improving disease-resistance has grown in recent years, Nimmakayala said, as a result of changes in fumigation practices that led to decreases in watermelon yields.

The funding will also allow the university to increase its capacity for student learning, providing additional hands-on opportunities for graduates and undergraduates. “The training in these technologies, along with the applied genomic procedures of horticulture, will brighten our students’ employment opportunities at both the state and national levels,” Nimmakayala said.

Funding is provided by the USDA National Institute of Food and Agriculture’s Capacity Building Grants Program, award number 2021-398821-34598.

Photo courtesy of West Virginia State University

NIH awards Marshall University professor \$1.8 million for nicotine addiction research

Courtesy of Marshall University Communications

Brandon J. Henderson, Ph.D., an assistant professor of biomedical sciences at the Marshall University Joan C. Edwards School of Medicine, has been awarded a Research Project Grant (R01), one of the most competitive grants issued by the National Institutes of Health (NIH).

Henderson was awarded the \$1.86 million five-year grant (R01DA050717) from the National Institute on Drug Abuse to study the neurobiological and neurophysiological changes that occur due to vaping nicotine in flavored products. Henderson’s research team is working to better understand how electronic nicotine delivery systems, or vaping, alter neurobiology to trigger nicotine addiction in adolescents.

“Dr. Henderson’s R01 award represents a critical milestone in our efforts to expand Marshall’s research impact. He is exemplary of medical school faculty who are working diligently to develop innovative, exciting research to improve the lives of West Virginians,” said **Joseph I. Shapiro, M.D.**, vice president and dean of the Joan C. Edwards School of Medicine. “Addiction poses a unique challenge to our community and Dr. Henderson’s research holds promise in creating new opportunities to fight this evolving problem.”

“Our previous work that led to this award shows that some flavors by themselves may be addictive.”

- Brandon Henderson, Ph.D.

Nicotine addiction remains the number one cause of preventable death with an estimated 480,000 tobacco-related deaths each year, according to the Centers for Disease Control and Prevention. Vaping products are unique given the high concentration of nicotine, different nicotine formulations and flavor additives that may exacerbate addiction and increase risks for nicotine-related diseases and disorders.

Photo courtesy of Marshall University



Henderson

“Our previous work that led to this award shows that some flavors by themselves may be addictive. Therefore, it is critical that we understand how flavors and nicotine, independent of each other or combined, change the brain and contribute to addiction,” Henderson said.

The study will implement an adolescent mouse model system that examines nicotine reward and reinforcement translatable to human vaping. The team will then use modern-day neuroscience tools to determine specific changes in the regions of the brain most impacted by addiction using fluorescence microscopes and electrophysiology.

Since joining Marshall’s faculty in 2017, Henderson has authored or co-authored 15 papers in peer-reviewed journals, presented work nationally in 20 invited talks and has previously received R00 and R21 grants from the NIH.

The R01 is the original and historically oldest grant mechanism used by NIH. The R01 provides support for health-related research and development based on the mission of the NIH.



Above: Morgan Smith (on screen), design engineer for the Robert C. Byrd Institute in Huntington, delivers virtual training to sailors aboard the USS Tulsa in San Diego. The Navy will utilize 3D printing technology to produce components aboard the ship during deployment in the Pacific.

Robert C. Byrd Institute assists U.S. Navy with 3D printing technology

By **Mike Friel**

Navy sailors aboard the USS Tulsa now have access to 3D printing technology and the know-how to use it thanks to the Robert C. Byrd Institute (RCBI) at Marshall University and its Apprenticeship Works partner AST2.

RCBI's Apprenticeship Works and AST2 (Applied Systems & Technology Transfer) recently provided virtual training to help sailors prepare to use 3D printing technology while at sea. The ship's captain as well as its chief engineer Lt. Andrew Bardwell – himself a user of 3D printers at home – asked for volunteers to sign up for the additive manufacturing (3D printing) pre-apprenticeship.

Members of the ship's crew were taught to set up, operate and maintain LulzBot 3D printers and learned related computer-aided-design techniques as well as how

to operate Artec precision scanning equipment. Once at sea, sailors will practice what they've learned by 3D printing components used on the ship.

Morgan Smith, a design engineer based at RCBI Huntington, delivered computer-aided design training via Zoom to Navy personnel aboard the USS Tulsa some 2,200 miles away in San Diego. Before an item can be 3D printed, a drawing must be generated using 3D-modeling software

“We're proud to assist the Navy as it utilizes 3D printing technology to overcome logistical supply chain issues during deployments.”

- Charlotte Weber

Photo courtesy of The Robert C. Byrd Institute

then transferred to the 3D printer, which reads the data to build the item.

This isn't the first time RCBI has delivered 3D printing training to Navy personnel. In 2019, Chris Shaffer, a design engineer based at RCBI Charleston, twice flew to California to train other sailors to use 3D printers as part of RCBI's Military Advanced Manufacturing Pre-Apprenticeship Program.

“RCBI has been supporting the U.S. Department of Defense for more than 30 years now, developing supply chain links and delivering access to advanced technologies and creative workforce development solutions to meet the critical mission of the military,” said **Charlotte Weber**, RCBI director & CEO. “We're proud to assist the Navy as it utilizes 3D printing technology to overcome logistical supply chain issues during deployments.”

The Apprenticeship Works initiative supports advanced manufacturing apprenticeships and pre-apprenticeships nationwide, including pre-apprenticeships specially for active duty military personnel and veterans. Apprenticeship Works is supported by an American Apprenticeship Initiative grant from the U.S. Department of Labor.

WVSOM researcher finds that electronic health records can aid in preparing NAS interventions

Courtesy of **West Virginia School of Osteopathic Medicine**

As rates of substance misuse in West Virginia increased in recent years, **Jill Cochran, Ph.D., MSN, RN-BC, FNP**, an associate professor at the West Virginia School of Osteopathic Medicine (WVSOM), noticed the impact of maternal drug use on the patient population at the Robert C. Byrd Clinic, where she works as a nurse practitioner.

Cochran decided to take a proactive approach in tackling the rise in neonatal abstinence syndrome (NAS), the rate of which increased in West Virginia from 7.74 to 31.56 per 1,000 live births per year between 2007 and 2013. Using data from deidentified electronic health records (EHRs) of the clinic's NAS patients, Cochran and her fellow researchers conducted a cross-sectional study of secondary data examining factors such as second-hand smoke exposure, respiratory illness and developmental progress. The purpose of the study was to evaluate the ability of rural providers to use EHRs to identify, describe and monitor aspects of NAS across the pediatric health span.

The research was published as “Characteristics of Neonatal Abstinence Syndrome (NAS) in a Rural Clinic Population: Tracking With Electronic Medical Health Records (EHR)” in the Online Journal of Rural Nursing and Health Care.

“The literature says that as these patients get older, they might have issues with learning difficulties or behaviors,” Cochran said. “We wanted to see if the patient population in our pediatrics department matched

what was noted in the general population of NAS patients. We found that our population did have similar characteristics, which told us that as NAS patients enter the EHR system, we can tag their chart so that when they reach an age where we know a problem could arise, we can get timely referrals for interventions.”

The clinic's pediatrics department has already implemented one such intervention as a result of Cochran's research: an offshoot project consisting of a “telesoothe” visit. In these visits, which began in early 2020, a nurse communicates with an infant's mother via videoconferencing and illustrates how to soothe a baby through a specific swaddling technique.

“We were not aware of any pediatric practice that offered a soothing program via telehealth,” Cochran said. “We started the program with routine, in-person visits and used an infant simulator to demonstrate swaddling to family members. When the COVID-19 pandemic hit, many parents were isolated from their usual support system or extended family and weren't able to come to us for help, so we began offering the program by telehealth.”

This research was supported by the National Institutes of Health's (NIH) National Institute of General Medical Sciences (Award 5U54GM104942-04) and WVSOM. The content is solely the responsibility of the authors and does not necessarily represent the views of the NIH.



Joshi

Marshall computer science graduate student wins national competition

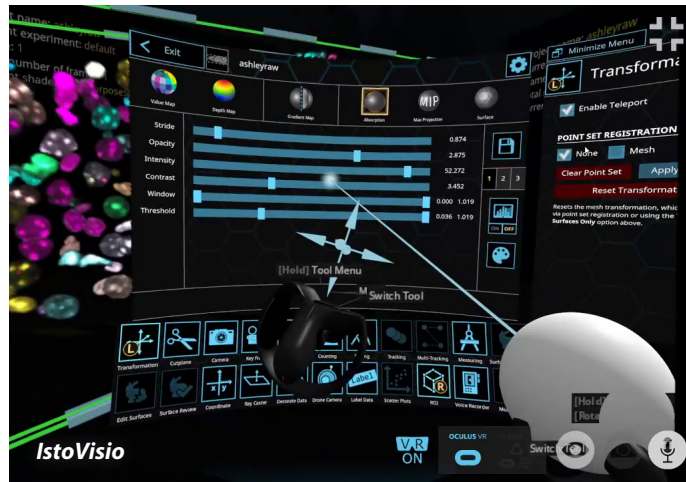
Marshall University graduate student **Vishwanshi Joshi**, a student in the Department of Computer Sciences and Electrical Engineering, was named a winner of the Special Interest Group on Computer Science Education Student Research Competition 2021, hosted by the Association for Computing Machinery (ACM) and Microsoft.



Risher

Marshall researcher receives grant to study nervous system development

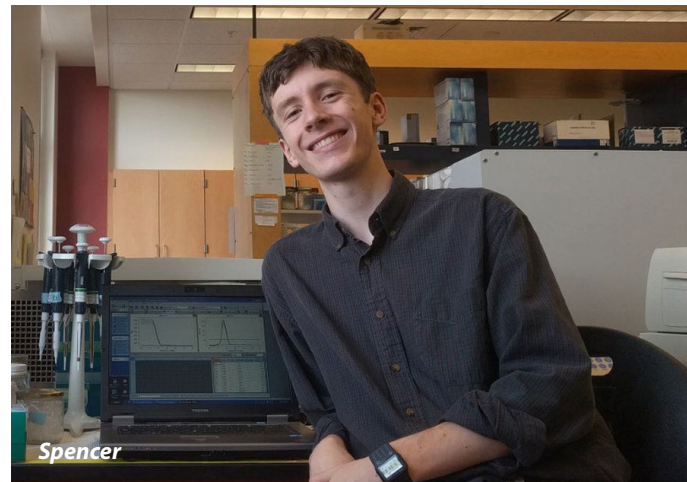
W. Christopher Risher, Ph.D., an assistant professor of biomedical sciences at the Marshall University Joan C. Edwards School of Medicine, has been awarded a \$399,600 grant from the National Institutes of Health (NIH) for his research on the differences in brain development between males and females.



IstoVisio

WVU spin-off company IstoVisio awarded funding for virtual reality research

IstoVisio, a WVU spin-off company that created syGlass, a software that analyzes data collected from large multidimensional volumetric data, was awarded a National Institutes of Health (NIH) Small Business Innovation Research grant. WVU will receive \$380,000.



Spencer

WVU biology student wins NSF Graduate Research Fellowship

Noah Spencer, a Honors Laureate and biology major who graduated in May 2021, was named a Graduate Research Fellow by the National Science Foundation. His current research focuses on the evolution of symbiosis between tsetse flies and the bacteria they depend on for survival.

Photos courtesy of Marshall University and West Virginia University

COMMENTARY: Anne Barth and Bryan Brown WV SBIR program successful in growing state's technology economy

The West Virginia Entrepreneurship and Innovation Investment Fund, through the West Virginia SBIR/STTR Matching Grant program, incentivizes and assists technology-focused companies in applying for federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants by offering matching dollars for those winning a federal SBIR/STTR award. The program also provides financial assistance to companies to help them formulate a competitive application.

The state matching grant program has created a tremendous 11-to-1 return on investment in its first fourteen months of operation, while growing our technology economy in the process.

These are stellar results and the West Virginia Legislature, Governor Justice, and the West Virginia Small Business Development Center (WV SBDC), operated under the auspices of the state Department of Commerce, deserve a great deal of credit.

From program inception in January 2020 through February of this year, the program incentivized 17 West Virginia technology-focused companies to apply for federal SBIR/STTR grants. Of the 17 applicants, 9 were awarded a total of 13 federal Phase I or Phase II SBIR/STTR grants. This is a phenomenal conversion rate (76%) as the federal SBIR/STTR program is highly competitive.

The 13 successful awards brought \$8.8 million in federal funds to West Virginia to be used in furthering these firms' technology and market commercialization, leading to job and wealth creation in the state. This is a 50% increase in the number of firms receiving awards compared to 2019, prior to the program launch.

Historically, West Virginia and other rural states have been underrepresented in the SBIR/STTR competition nationally due to fewer applications being submitted. The matching grant program, operated by the WV SBDC, has successfully helped state businesses find resources, apply effectively, and improve results.

This program is not only helping businesses secure federal dollars, it is accelerating the diversification of West Virginia's economy, enabling the creation of high-paying

jobs, and growing the state's technology sector.

Unfortunately, due to COVID-related impacts to the program's funding source, the portion of the program that provides matching funds is temporarily closed to new applicants. State leaders should consider options for fully funding the program, as demand continues to grow and the results speak for themselves.

The WV SBDC and TechConnect West Virginia partnered to conduct 17 public awareness and educational trainings on the federal SBIR/STTR program and the state matching grant program over the past eighteen months. More than 425 entrepreneurs participated in these bootcamp events and 231 individuals received writing, solicitation matching, and technical assistance. These numbers showcase the interest that exists from West Virginia technology-focused companies in applying for federal SBIR/STTR grants.

This is a recipe for success that we must continue. Let's identify funding to replenish the SBIR/STTR State Matching Grant Program and keep growing our state's technology economy.



Barth

Anne Barth is the Executive Director of TechConnect West Virginia, an statewide economic development organization focused on driving innovation, cultivating entrepreneurship and creating economic diversity. Barth has a Bachelor's Degree in Journalism and a Master's Degree in Corporate and Organizational Communications from West Virginia University.



Brown

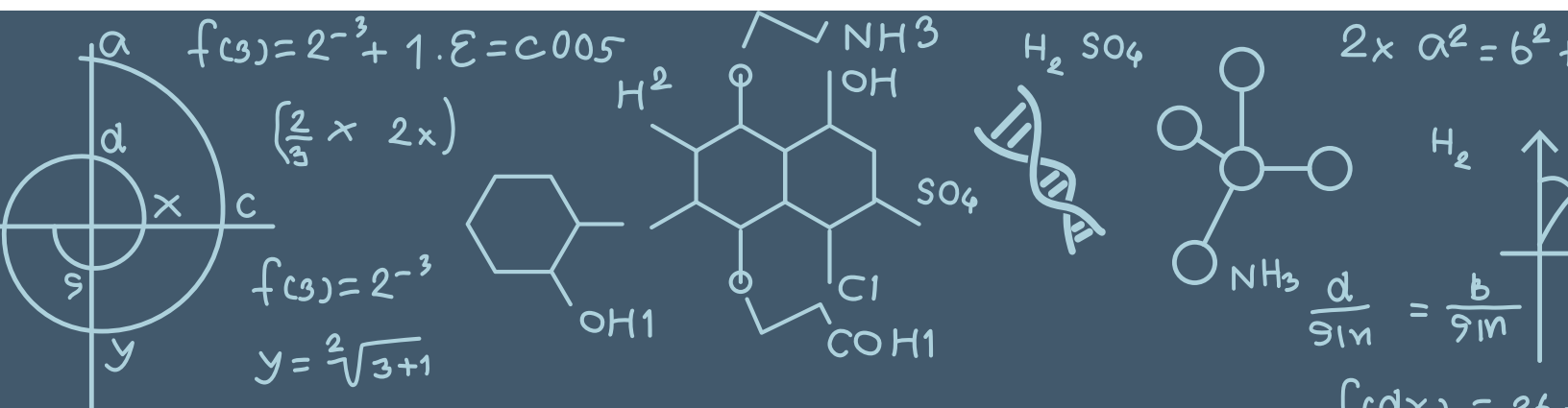
Bryan Brown serves as the Executive Director of the Bioscience Association of West Virginia, an organization working to promote and grow the state's life science economy. Brown is also the owner of Brown Communications, LLC. Brown received his Bachelor's Degree in Journalism from West Virginia University.

Photos courtesy of Anne Barth and Bryan Brown



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