



From the Meharry Medical College Office for Research and Innovation

**ANNOUNCEMENTS**

**Upcoming/ongoing events:**

- **Meharry launches SISTER study** to find ways to help African American women with diabetes eat and live healthier, and to help health care professionals provide better diabetes care. Study participants will receive, among other things, **free nutritionist support, diabetes education materials, and healthy snacks.** They will also receive **compensation for time and travel.** To learn more about the study and to find out if you are eligible, click [here](#).

- **Meharry-UNC partnership announces 2022 Faculty Award.** In collaboration with the [Eshelman Institute](#), we seek to fund translational research related to therapeutics and digital health technologies focused on oncology, infectious disease, and neuroscience (including rare diseases) that will generate protectable IP and has commercial potential. The Institute also welcomes ideas for devices and diagnostics in other therapeutic areas and services. **Projects must include a UNC collaborator.** Interested PIs must submit a pre-proposal to be considered for advancement to the full proposal round.

Open period for pre-proposal submission: **Nov 29, 2021 to Jan 6, 2022**

For grant guidelines, click [here](#). For information on timeline and how to engage with UNC collaborators, click [here](#).

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**THE VP'S COLUMN**



Dear Meharrrians:

The disproportionate toll of the ongoing COVID-19 pandemic on Black, Hispanic/Latinx, and lower-income communities has highlighted long-standing disparities in health and health care. Despite widespread appreciation of these disparities, little has changed over the last decades. Consistent evidence also documents the benefits of workforce diversity across multiple disciplines, including science and healthcare. Yet, African Americans, Hispanics, and other minorities continue to receive academic degrees and appointments in STEM disciplines at rates that are substantially lower than their representation in the US population. Recommendations in 2012 by the Advisory Committee to the National Institutes of Health Director Working Group on Diversity in the Biomedical Research Workforce emphasized strategies to increase diversity in the biomedical and health professional workforce.

It is well established that an inclusive and competitive biomedical and behavioral research workforce is the foundation for turning discovery into health for all. However, this was long disregarded until the global George Floyd protests in 2020 and the increasing push to prioritize diversity, equity, and inclusion that culminated in the passing of the Executive Order on Diversity, Equity, Inclusion, and Accessibility on June 25, 2021 by President Biden.

For nearly 150 years, Meharry Medical College, named after Irish American Samuel Meharry, has served as a steadfast beacon of hope among the diverse communities of underrepresented populations. Providing opportunities for people of color, individuals from disadvantaged backgrounds, and all others—regardless of gender, race or ethnicity, and geographical origin—is central to the Meharry mission. The College is home to a diverse body of students, faculty, and staff who work together with the singular mission of eliminating health disparities in marginalized populations. Meharry African American faculty member Dr. Dolores Shockley, the first woman to receive a Ph.D. in Pharmacology in 1955, became the first Black woman in 1988 to chair a Pharmacology department in the United States. With funding from the National Institute on Drug Abuse, she established a drug addiction research program at Meharry, the first of its kind at a historically Black college or university. Likewise, in 1972, Asian American faculty member Dr. Salil Das from the then Department of Biochemistry and Nutrition became the first at Meharry to receive an NIH R01 grant for his research on “Nutrition and Lipids of Oral Tissues”. Meharry’s greatest strength is the talent and entrepreneurial nature of its committed faculty, students, and staff. Our inclusive workforce, immersive community outreach, and heritage of healing equip us with unmatched insight and impact.

It is the goal of the Office for Research and Innovation to guide Meharry researchers and students to opportunities that match their talents and expertise. By supporting all Meharrrians in their pursuit of new knowledge, skills, and potential, I am confident that we will transform Meharry into a global academic health science institution.

As we look forward to this holiday season, I would like to personally thank all Meharrrians for their passion, commitment, and contribution towards science and health care for marginalized populations.

With kind regards,

Anil Shanker, M.S., Ph.D.  
Senior Vice President for Research and Innovation  
Professor of Biochemistry, Cancer Biology, Neuroscience and Pharmacology

**FUNDED INVESTIGATORS**

**Congratulations to all Meharry investigators who have received extramural funding!**

**Biochemistry, Cancer Biology, Neuroscience and Pharmacology**  
Adunyah, Samuel E.  
Sapp, Nicklas  
Shanker, Anil  
Son, Deok-Soo  
Stewart, LaMonica V.  
Balasubramaniam,  
Muthukumar

**Center for AIDS Health Disparities Research**  
Dash, Chandrananu  
Dong, Xinhong  
Liu, Bindong  
Popik, Waldemar  
Pandhare, Jui

**Center for Molecular & Behavioral Neuroscience**  
Charlton, Clivel G.

**Central Administration**  
Samuels, Adrian D.

**Dental Dean's Office**  
Farmer-Dixon, Cherae

**Family & Community Medicine**  
Collins, Millard  
Cooper, Robert L.  
Juarez, Paul D.  
Matthews-Juarez, Patricia  
Morelli, Vincent  
Sanderson, Maureen

**Graduate Dean's Office**  
Motley, Evangeline D.  
Woods, Letha

**Graduate Studies**  
Actkins, KyEra  
Pratap, Siddharth  
Sakwe, Amos M.

**Internal Medicine**  
Berthaud, Vladimir  
Erves, Jennifer C.  
Fremont, Richard  
Singh, Rajbir  
Smoot, Duane

**Medical Dean's Office**  
Forbes, Digna S.

**Microbiology, Immunology, and Physiology**  
Borza, Dorin Bogdan  
Chaudhuri, Minu  
Liu, Bindong  
Nde, Pius N.  
Villalta, Fernando

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Email the [Eshelman Institute](#) if you wish to discuss your proposal with them.

- **Meharry receives funding and scholarships from Abbott.** These will support the training of **ethnically diverse healthcare professionals and researchers.** Click [here](#) to read more about the Abbott Scholars scholarship program.
- **Imaging systems at CRISALIS.** Assistance available on M-F 8 am-5 pm. Independent usage is possible after completion of training. The systems available are:
  - (i) The Nikon TE2000 wide-field microscope
  - (ii) The Nikon A1R fully automated confocal imaging system
  - (iii) The Nikon N-STORM with TIRF imaging (by assistance only)Visit the [CRISALIS website](#) for details about the systems  
Email [CRISALIS staff](#) with questions or to schedule training.
- **Survey on pediatric daycare by the Department of Pediatrics to gauge the need and interest among Meharry community.** To complete the survey, click [here](#). Contact [Dr. Xylina Bean](#) or [Dr. Dontal Johnson](#) with questions.
- **The Division of Student Affairs launches online survey for students** to seek their opinions and feedback on student engagement. Survey participants can enter a drawing for the **chance to win a pair of wireless headphones or a ticket to the African American Music Museum.** Click [here](#) to complete the survey. Questions? Contact [Dr. Adrian McLain](#), enrollment manager, or [Dr. Christopher Garner](#), Director of Student Life.
- **Meharry receives continued support** (*continued...*)

## SPOTLIGHT

### Meharry joins the new NIH-funded AIM-AHEAD consortium

Meharry Medical College is now part of the new NIH-funded Coordinating Center for the Artificial Intelligence/Machine Learning (AI/ML) Consortium to Advance Health Equity and Researcher Diversity ([AIM-AHEAD](#)) program.



Led by Senior Vice President for Research and Innovation **Dr. Anil Shanker**, Meharry joins the leadership core of this two-year, \$100 million project. The Meharry team also includes **Dr. Paul Juarez** (top right), professor and director, Health Disparities Research Center of Excellence; **Dr. Qingguo Wang** (bottom left), professor and chair of the Department of Computer Science and Data Science; and **Dr. Rajbir Singh** (bottom right), assistant professor of internal medicine.

The consortium aims to plan, assess, and improve AI/ML capabilities of minority populations as well as to build their workforce diversity. Click [here](#) to read Meharry's news release regarding the consortium.

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### Meharry seeks to recruit adults aged 60 and older for RSV vaccine research trials

Partnering with [Clinical Research Associates \(CRA\)](#) of Nashville, Meharry is currently recruiting adults aged 60 years and older to participate in two separate clinical studies for respiratory syncytial virus (RSV) research vaccines, called the EVERGREEN Study and the RENOIR Study, respectively.



RSV is likely "the most common infectious disease virus you have never heard of", according to **Dr. Michael C. Caldwell**, an associate professor of internal medicine and professional & medical education at Meharry. Dr. Caldwell is an investigator for both RSV vaccine clinical trials. He also leads the development of a new partnership between Meharry and CRA.

For most people, RSV causes mild flu-like symptoms that usually subside within one to two weeks. However, it can also lead to serious complications, especially in older adults and young children. According to the CDC, more than 177,000 older US adults are hospitalized with RSV annually. Of those cases, 14,000 die from the disease. Globally, the toll of RSV is an astounding estimated 33 million cases among children younger than five years old, with nearly three million hospitalizations and roughly 120,000 deaths. While the COVID-19 pandemic suppressed RSV in 2019–2020, RSV cases have already exceeded normal summer levels in 2021. Many are anticipating a wave of infections during the colder months.

Although its impact on young children and older adults is tremendous, RSV has remained unnoticed due to the lack of tools to test for, to treat, and to educate people about the virus. The situation is beginning to improve on this front with the emergence of new scientific advances. For instance, Meharry now performs point-of-care testing with a multiplex polymerase chain reaction (PCR) that detects RSV, the flu virus, and SARS-CoV-2 (which causes COVID-19) in a single sample with 98% sensitivity and 100% specificity.

Unfortunately, there is still no treatment or vaccine for RSV. The medical world is limited to offering only supportive care such as oxygen and fluids to those with the illness. Additionally, the only available tool to prevent RSV is a prophylactic monoclonal antibody known as palivizumab. It is injected into susceptible infants once a month during the RSV season. Its use is limited largely to very prematurely born infants or infants with significant heart or lung disease. This often impacts babies of color who are at a significantly greater risk of being born premature and often fall short of meeting the prophylaxis criterion. "We have been searching for an adequate vaccine candidate for RSV for 50 years" said Dr. Caldwell. Unfortunately, a vaccine for RSV has been elusive thus far due to scientific hurdles.

New scientific discoveries have renewed our hope for an RSV vaccine for both adults through direct vaccination and infants through maternal immunization. For instance, we now know that RSV attaches to cells via an

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- Obstetrics & Gynecology**  
Aguinaga, Maria del Pilar
  - Oral Biology & Research**  
Gangula, Pandu R.
  - Pathology, Anatomy & Cell Biology**  
James, Samuel
  - Pediatric Medicine**  
Wyche-Etheridge, Kimberlee
  - Professional Medical Education**  
Regina Offodile
  - Psychiatry**  
Heckman, Bryan  
Williamson, Lloyd
  - Surgery**  
Miller-Hughes, Stephania
  - School of Applied Computational Sciences**  
Cao, Aize
- \*\*\*
- Please submit this [REDCap survey](#) to share news of your awards with us. We look forward to celebrating your achievements!*

from Thermo Fisher Scientific for COVID-19 testing on HBCU campuses through [The Just Project](#). Click [here](#) to read more.

- **Grant pacing workshops and resources by Vanderbilt University.** Postdocs and early-career faculty who are preparing to compete for career development awards or R01 grants are invited to participate. Click [here](#) to learn more or contact [Dr. Ashley Wood](#). If interested, please review information timely as deadlines are enforced.
- **The Faculty Research and Education Development (FRED) mentoring program by the American Society of Cell Biology** offers grant writing mentoring to junior faculty and senior postdocs from underrepresented backgrounds in STEM. Those at minority-serving institutions and institutions committed to recruiting students from backgrounds underrepresented in STEM are also eligible. Click [here](#) to learn more.
- **New funding opportunities from the NIH/NHGRI.** Current due date is **Feb 22, 2022**. Click [here](#) for details and pay attention to the announcement email from Dr. Anil Shanker.
- Meharry researchers invite you to join the **Meharry Research Partners database** for opportunities to volunteer in research studies aimed at tackling the disproportionate disease burden among the medically underserved and ethnic minorities. To learn more, click [here](#).
- Grant development “Chalk-talk” sessions available to junior investigators to help develop their specific aims. Request your session at [VP-Research@mmc.edu](mailto:VP-Research@mmc.edu)

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attachment protein called “G”, and fuses with host cells through its fusion protein called “F”. New revelations on the structure of this “F” protein has allowed researchers to design vaccines that target it. An effective RSV vaccine will prevent the virus from fusing to and infecting host cells. “Recent scientific advancements have uncovered new targets on the ‘F’ protein that show great promise,” Dr. Caldwell said. “There are many RSV vaccine candidates in late development, including two in Phase 3 clinical trials here in Nashville.”

Meharry and CRA are partnering to expand educational efforts about RSV disease and are encouraging anyone aged 60 and older to learn how they can participate. “We can’t advance science without volunteers for our research,” Dr. Caldwell explained. “If you are over the age of 60 or know someone who is, please alert them to this important research opportunity. Enrollment is time-limited.”

To watch Dr. Caldwell’s presentation on RSV, click [here](#). Passcode: @jBLH96?

For the CDC page on RSV, click [here](#).

To learn more and to sign up for the RSV vaccine research trials, click [here](#). All relevant contact information is also available on this page.

To learn more about the EVERGREEN Study and the RENOIR Study, click [here](#). Please help us with recruitment by sharing this literature with your patients as well as family and friends.

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### Meharry faculty joins the leadership of LEADS as site principal investigator



**Dr. Jamaine Davis** (pictured), as assistant professor of biochemistry and cancer biology, has been appointed the site principal investigator for Meharry in the LEADS program. He will also serve on the program’s advisory committee.

LEADS stands for “Leading Emerging and Diverse Scholars to Success”. It is an NIH R25-funded program through the National Institute of General Medical Sciences and facilitated by University of Pittsburgh (UPitt). It began in 2015 as a one-year program in translational research that aims to support junior faculty and postdoctoral fellows at minority-serving institutions that partner with UPitt in this program. Specifically, it offers participants opportunities to develop skills essential to their success in academia, such as in grant writing, forging

research collaborations, and more. Thus far, LEADS has mentored 70 scholars from 12 institutions. Together, these scholars have gone on to publish over 130 articles and secured research funding at a success rate of over 60%.

Recently, LEADS successfully renewed its funding for the next five years. Now known as LEADS 2.0, the program is expanding to provide two-year fellowships and other new initiatives. One of these initiatives is a module on obtaining research funds that Dr. Davis will teach. As a LEADS alum, Dr. Davis has capitalized on the program’s resources to achieve success in his own career. “The best resource has been the writing accountability groups formed with other LEADS scholars,” he said. Attending weekly writing groups has helped him with the submission of several manuscripts and grants.

Dr. Davis’s input was instrumental to LEADS’s funding renewal. As Meharry’s site leader for LEADS, he will help recruit future LEADS scholars. He will also meet regularly with current scholars to provide career support. There are currently six LEADS scholars at Meharry: Drs. Jennifer Cunningham-Erves, Leah Alexander, Mekeila Cook, Michelle Etling, Tameka Clemons, and Elizabeth Stewart.

Dr. Doris Rubio, Director of Institute for Clinical Research Education at UPitt who spearheads LEADS, is delighted with Dr. Davis’s leadership role in LEADS. “Dr. Davis has played a critical role in shaping LEADS 2.0 and in securing the renewal of our grant. I look forward to working with him and Meharry over the next five years.”

Click [here](#) to learn more about LEADS.

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### First Meharry scholar enters Penn Wharton/Meharry MD/PhD program



Fourth-year medical student **Cynthia Chude** (pictured) began her doctoral studies in Fall 2021 at the University of Pennsylvania Wharton Health Care Management (HCM) department. The inaugural recipient of the Escarse-Kington Five-Year Scholarship is the first Meharry scholar to matriculate in the new Wharton/Meharry joined MD/PhD program. The Escarse-Kington scholarship honors Drs. [José Escarce](#) and [Raynard Kington](#), two of HCM’s most distinguished alumni and examples of successful minority researchers and academicians. At Penn, Chude joins over 500 fellows at the Leonard Davis Institute of Health Economics (LDI) who strive to solve some of the most challenging issues in health and healthcare.

Born in Nigeria, Chude moved to the US with her family when she was 10. Although members of her family face a myriad of health issues, she did not experience the kind of disparities and discrimination that is apparent in the US until she moved here. In an interview with LDI, she said, “Sometimes, I joke around and tell people that I didn’t know I was black until I came to America.”

Originally interested in becoming a nurse, Chude decided to pursue an undergraduate degree in Biology at the University of Massachusetts, Dartmouth. Upon graduation in 2014, she worked as a research assistant at Penn for two years in the laboratory of Dr. Ravi Amaravadi. There, she researched the use of inhibitors of autophagy, or “self-eating” of cells, in augmentation treatment for patients with melanoma, a type of skin cancer. She started medical school at Meharry in 2018.

The COVID-19 pandemic strengthened her resolve to tackle issues of health disparities because she witnessed how the pandemic has impacted essential workers and other underserved populations. She enrolled in Meharry’s Health Care Policy and Management certificate program because she wants to understand how policies are enacted and how they can affect her efforts as a physician to care for her patients.

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#### Past events:

- **Nov 12, 2021: President's Town Hall.** To watch the recording, click [here](#).
- **Nov 9, 2021: President Hildreth's op-ed in the Tennessean** on COVID restrictions in Tennessee. Click [here](#) to read.
- **Oct 25, 2021: President Hildreth discussed COVID-19, vaccine approvals, and disparities on C-SPAN.** Click [here](#) to watch the interview.
- **Oct 13, 2021: Presentation on respiratory syncytial virus (RSV) by Dr. Michael C. Caldwell.** Dr. Caldwell is the investigator of two RSV vaccine trials in Nashville and is currently recruiting volunteers (see **Spotlight** section for details). Click [here](#) for the recording of the talk. Passcode: @jBLH96?
- **Oct 4, 2021: Virtual Convocation.** Convocation speaker was **Dr. Michael Eric Dyson**, professor, author, and commentator. Click [here](#) for recording.
- **Oct 1, 2021: The announcement of the MMC-TSU Watkins Baxter Scholars.** Click [here](#) to read more.
- **Sept 29, 2021: 65<sup>th</sup> Annual Student Research Day** featuring over 130 medical, dental, MSPH, and Ph.D. students. Click [here](#) for research posters and recordings under **Student Research Day 2021** tab.

### MORE INFORMATION?

[Meharry Research](#)

[OfRI Services and Support Unit](#)

[Meharry Community Engagement Core](#)

[Meharry's research history](#)

[COVID-19 lab safety guidelines](#)

[ResearchPoint](#)

[Yammer](#)

When the opportunity to apply for the Wharton/Meharry joined MD/PhD program arose, Chude seized it on the encouragement from Dr. Amaravadi and Dr. Alfred M. Nyanda at Meharry. Though the application process itself was manageable, she found it so challenging to cope with her schoolwork and third-year rotations at Meharry while studying for the Graduate Record Examinations (GRE) that she almost gave up. Fortunately, with the support from her mentors and her family, she was able to fulfill all her obligations.

At Wharton, she is working towards a PhD in Health Care Economics and Management. While it is still early in the program for Chude to decide on her research project, "My research interests are healthcare disparities and social determinants of health," she said. Social determinants of health reflect the contexts in which people are born, grow, live, work, worship, and age. They are shaped largely by resource or power (mis)distribution and account for up to 80% of health outcomes. "I want to work on reducing the effect of social determinants of health on our healthcare system in order to provide all patients with the best health care available," she explained. She hopes to improve her understanding of the economics of healthcare, to work with others in the field to devise better models for payment plans that can reduce costs, and to increase access to healthcare.

Chude's experience with the Wharton/Meharry joined MD/PhD program thus far has been a sobering one. "Going from a biological science background into a mathematical science program has been a very tough," she said. She is currently taking classes in calculus, linear algebra, and advanced statistics. "I am learning a lot very quickly and making connections between medicine and statistical models," she added. She is relieved that the Wharton HCM department is very supportive. "They provide you with all the resources you need and help with getting a tutor if you need one."

To those interested in the Wharton/Meharry joined MD/PhD program, Chude's advice is to plan early and to brush up on their math skills. "I also recommend studying and sitting for the GRE in the summer of the second year of medical school so that it doesn't coincide with studies and rotations in the third year."

Chude has big goals for the future. She wants to specialize in physical medicine and rehabilitation. "I would like to improve the type of wound care we provide to our patients, especially patients with diabetes," she said. "I believe that with better access to wound care, we can reduce the number of patients that need surgical amputation, ultimately saving the economy a lot of money on invasive procedures."

Visit the following websites to learn more about social determinants of health:

[Social Determinants of Health - Healthy People 2030 | health.gov](#)

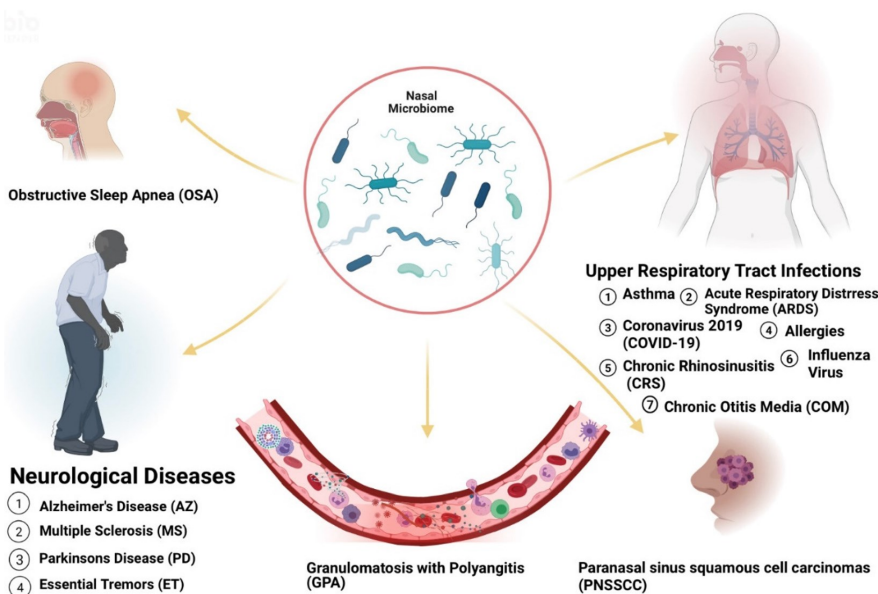
[WHO | Social determinants of health](#)

## PUBLICATION HIGHLIGHTS

Want your publications featured in the Publication Highlights? Please complete this [REDCap survey](#) to share the information with us!

**From the group of Drs. Fernando Villalta and Girish Rachakonda:**

**Respiratory and neurological disease across different ethnic groups is influenced by the microbiome.** Odiase Peace, Kartik Rachakonda, Miller Kress, Fernando Villalta, Girish Rachakonda. *Microorganisms*. 2021 Sept 16. DOI: [10.3390/microorganisms9091965](#)



The relationship between dysbiosis in nasal microbiomes and the development of several diseases. Figure obtained from Peace et al., *Microorganisms* 2021, 9(9), 1965. Reproduced under the [Creative Commons Attribution License](#).

This review examines the relationship between nasal microbiomes and neurological and respiratory health (shown on left). Specifically, it focuses on the ethnic diversity of these microbiomes and how they impact neurological and respiratory health outcomes. Such diversity may contribute to health disparities. Unfortunately, research on how racial and ethnic differences influence the diversity of nasal microbiomes is lacking. Moreover, in the US, the unique microbiome signatures among different racial and ethnic groups have not been fully characterized. Nonetheless, available evidence thus far has implicated the impact of nasal microbiomes on many diseases and conditions, including asthma, acute respiratory distress syndrome, influenza virus infection, COVID-19, sleep apnea, multiple sclerosis, Alzheimer's, Parkinson's, and nasal carcinomas, to name a few. Additionally, the nasal microbiome can affect the immune system by influencing mucus production as well as various cellular and inflammatory responses. Certain microorganisms in the nasal microbiomes can also produce antimicrobial compounds to ward off infection and to maintain homeostasis in a healthy environment. Finally, other factors such as diet, smoking, socioeconomic status, and living and work environment can influence the compositions of nasal microbiomes. Diverse habits and living conditions among individuals from different racial and ethnic backgrounds can compound the impact of these factors, further highlighting the potential of health disparities. In short, more research is warranted to understand the complexity of nasal microbiomes and how they affect the health of individuals from diverse backgrounds.

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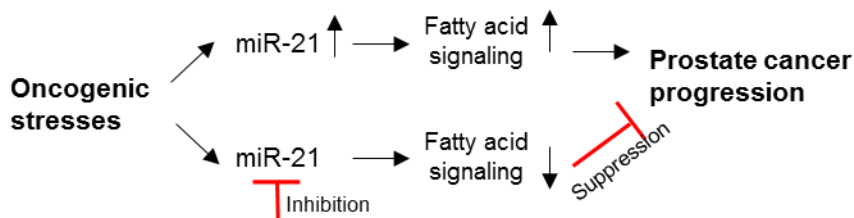
From the group of Dr. Jennifer Cunningham-Erves:

**A pilot study of a culturally appropriate, educational intervention to increase participation in cancer clinical trials among African Americans and Latinos.** Jennifer Cunningham-Erves, Tilicia L. Mayo-Gamble, Pamela C. Hull, Tao Lu, Claudia Barajas, Caree R. McAfee, Maureen Sanderson, Juan R. Canedo, Katina Beard, Consuelo H. Wilkins. *Cancer Causes & Control*. 2021 Sept. DOI: [10.1007/s10552-021-01449-7](https://doi.org/10.1007/s10552-021-01449-7)

This study examined how a simple and culturally appropriate 30-minute presentation with video testimonials may affect the knowledge of clinical trials among African American and Latinos in Middle Tennessee as well as their willingness to participate in clinical trials. Trained community health educators delivered the presentation to 198 study participants across 13 town halls. The participants completed a survey both before and after the presentation. The participants showed significant increases in unadjusted mean scores for knowledge as well as their trust in medical researchers and willingness to participate. Adjustment for gender and education did not alter this significance for the overall cohort and for African American participants. However, the increase in willingness to participate was no longer significant among Latino participants after the adjustment. Findings from this study demonstrates that culturally appropriate educational material may positively impact clinical trial participation among members of certain racial and ethnic groups. However, further, better-designed studies with more extensive follow-up procedures are needed to investigate additional factors that may influence willingness to participate.

From the group of Dr. Zhenbang Chen:

**MicroRNA-21 deficiency suppresses prostate cancer progression through downregulation of the IRS1-SREBP-1 signaling pathway.** Thanigaivelan Kanagasabai, Guoliang Li, Tian Huai Shen, Nataliya Gladoun, Mireia Castillo-Martin, Sheryl I. Celada, Yingqiu Xie, Lakendria K. Brown, Zaniya A. Mark, Josiah Ochieng, Billy R. Ballard, Carlos Cordon-Cardo, Samuel E. Adunyah, Renjie Jin, Robert J. Matusik, Zhenbang Chen. *Cancer Letters*. 2021 Oct 2. DOI: [10.1016/j.canlet.2021.09.041](https://doi.org/10.1016/j.canlet.2021.09.041)



MicroRNA-21 (miR-21) regulates fatty acid signaling in human prostate cancer cells. Upon exposure to oncogenic stresses, miR-21 levels are elevated to enhance fatty acid signaling, which in turn promotes prostate cancer growth. Targeting miR-21 may reduce fatty acid signaling, subsequently suppressing prostate cancer progression.

Sterol regulatory element-binding protein 1 (SREBP-1), a transcription factor that regulates lipid synthesis and metabolism, has been implicated in the poor prognosis of prostate cancer. Additionally, microRNA-21 (miR-21) has been detected in various cancers with poor prognosis and is considered an oncogene for prostate cancer. miRs are non-coding RNAs that regulate various cellular processes, including cell proliferation, cell death, and metastasis, many of which are important in cancer development. Here, the authors used a mouse model for prostate cancer, embryonic

fibroblast cells derived from these mice, and cultured human prostate cancer cell lines to investigate the relationship between miR-21 and SREBP-1. They found that a decrease in miR-21 levels reduced cell proliferation and induced cellular senescence; the latter is a state where cells can no longer grow and divide. Consequently, prostate cancer growth was suppressed. In cultured human prostate cancer cells, miR-21 overexpression enhanced cell proliferation while miR-21 inhibition suppressed cell invasion. Finally, miR-21 overexpression led to increased expression of *IRS1*, *SREBF1*, *FASN*, and *ACACA* genes, all of which play a role in insulin signaling as well as lipid synthesis and metabolism. The reverse occurred when miR-21 was suppressed. Therefore, the authors proposed targeting miR-21 and, consequently, insulin/fatty acid signaling as a novel strategy for treating prostate cancer.

From the group of Dr. Bindong Liu:

**Medroxyprogesterone acetate (MPA) enhances HIV-1 accumulation and release in primary cervical epithelial cells by inhibiting lysosomal activity.** Xiangxu Jia, Qiujia Shao, Ahsen R. Chaudhry, Ballington L. Kinlock, Michael G. Izban, Hong-Ying Zhang, Fernando Villalta, James E. K. Hildreth, Bindong Liu. *Pathogens*. 2021 Sept 14. DOI: [10.3390/pathogens10091192](https://doi.org/10.3390/pathogens10091192)

The authors examined how medroxyprogesterone acetate (MPA), one of the most widely used contraceptives in areas around the world where HIV is highly prevalent, may promote HIV transmission. Using human primary cervical cells and cultured vaginal cells, they found that MPA exposure reduced the lysosomal activity in these cells. Lysosomes are membrane-bound structures within a cell that carry digestive enzymes. One important function of these enzymes is to break down bacteria and viruses that invade the cell. Consequently, the cervical and vaginal cells that had been exposed to MPA were less capable of clearing bacterial or viral infection. Upon HIV infection, these cells showed higher levels of HIV accumulation. Moreover, exposure to MPA also caused these cells to release HIV more readily, thus enabling the virus to infect even more cells. The authors proposed future mechanistic studies to further investigate how MPA affects lysosomal activity.

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### JHCPU EDITOR'S PICK

CONTRIBUTED BY DR. VIRGINIA BRENNAN

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*Journal of Health Care for the Poor and Underserved (JHCPU)* is a Meharry-owned and edited journal published by the Johns Hopkins University Press. For more information, please contact journal editor Dr. Virginia Brennan at [vbrennan@mmc.edu](mailto:vbrennan@mmc.edu).

**Effects of different types of childhood victimization on health outcomes: A study of African American young adults in Washington, D.C.** Forough Saadatmand, Jennifer Bronson, Craig Dearfield, Ebony Russ, Roderick Harrison. Volume 32.4. Nov 2021. Click [here](#) to read the full text.

As *JHCPU* closes out its 32<sup>nd</sup> volume, it has achieved breadth in numerous senses. For example, we have the breadth to pivot to address pressing current issues, such as violence and COVID-19, the general topics of seven papers in this issue. We have also grown in our geographic breadth: the current issue, in addition to many general interest papers and papers on populations in North America, includes two concerning the whole region of sub-Saharan Africa. Readers will also find papers concerning Guatemala; Niger State, Nigeria; and Peru.

Our breadth, however, remains centered on stubborn public health challenges and solutions among underserved populations, including racial and ethnic minority populations, sexual/gender minority populations, immigrants and refugees, Indigenous populations, and rural populations. All these examples find space in this issue, which also includes 10 papers with fresh ideas and research on clinical care of underserved populations.

Among the papers on violence in this issue is an important one by Forough Saadatmand, PhD, from the College of Medicine at Howard University. Saadatmand and colleagues worked with a group of over 600 young adults who identified as African American/Black and resided in low-income neighborhoods. The title of their paper is, “Effects of different types of childhood victimization on health outcomes: A study of African American young adults in Washington, D.C.”

Prior research has established that there are strong connections between exposure to violence in childhood and later mental and physical health disturbances. It has also established that African American are more likely than White children to be exposed to violence. Saadatmand and colleagues drilled down further to ask whether specific types of exposure during childhood were associated with specific types of mental health sequelae in young adulthood.

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The authors situated their work in the Stress Process Model, which “highlights the impact of multiple sources of stress across ecological domains such as racism, low socioeconomic status, housing interferences, family structure and levels of resilience, mediators, and moderators of stress (e.g., resources for social support and coping), and outcomes of stress (e.g., mental health symptoms), which are viewed as related elements in understanding children’s exposure to violence.”

The findings demonstrate that the type of violence a person is exposed to in childhood is correlated with specific mental health outcomes in young adulthood. It is important to note that showed that exposure to violence was associated with all six outcomes tested except lifetime alcohol and other drug (ATOD) use (current ATOD use, experiencing ATOD problems, trouble sleeping, depressive symptoms, and depressive moods).

However, the results of Saadatmand’s study forefront the strong associations of mental health sequelae in young adulthood with two specific types of violence: childhood maltreatment<sup>1</sup> and peer/sibling violence<sup>2</sup>. The authors summarize their findings this way:

“While childhood exposures to any type of violence were often significantly associated with adverse health outcomes [Depressive symptoms, depressive moods, trouble sleeping, substance use], peer/sibling violence and childhood maltreatment had the greatest impact on the respondents’ current health outcomes. This is especially important since 55.1% and 41.1% of the respondents, respectively, reported experiencing these two types of violence. A pattern worth noting is that these two types of violence always seem to correlate more highly with outcomes than exposure to conventional crime does—violence *within* the family and peer group has stronger effects than general exposure to conventional violence. Additionally, exposure to sexual violence usually (though less consistently) has strong effects.”

They concluded their study by answering their research question: Specific types of exposure to violence in childhood are associated with specific types of mental health conditions in young adulthood.

<sup>1</sup>The authors characterize this: Measures of *child maltreatment* included physical abuse by caregiver, psychological/emotional abuse, neglect, and custodial interference or family abduction (defined as one parent taking, keeping, or hiding a child to prevent the child from being with the other parent).

<sup>2</sup>The authors characterize this: Measures of *peer and sibling victimization* included gang or group assault; peer or sibling assault; nonsexual genital assault; bullying; emotional bullying; and dating violence.

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## SERVICE GRANT HIGHLIGHTS

Meharry’s **School of Applied Computational Sciences (SACS)** received a **National Science Foundation (NSF) Major Research Instrumentation (MRI) grant award** to create a high-performance computing network with two supercomputers. This is one of the largest NSF awards that Meharry has received directly. Click [here](#) to learn more.

Congratulations!

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## RESEARCH GRANT HIGHLIGHTS

The **Meharry Medical College/Vanderbilt-Ingram Cancer Center/Tennessee State University Partnership (MVTCP)** renewed its funding through the **U54 Comprehensive Partnerships to Advance Cancer Health Equity (CPACHE) program**. Currently in its 22<sup>nd</sup> consecutive year of funding, the MVTCP is the longest-standing partnership through the program. MVTCP aims to eliminate cancer health disparities. Click [here](#) to read more.

Congratulations!

*Want to share your research news, highlights, and announcements with us? Want your stories featured in The Research Digest? Please submit this [REDCap survey](#) to share your updates with us. We look forward to celebrating your achievements!*



**Happy Holidays!**

The Office for Research and Innovation wishes all Meharrians and their families a safe and joyful holiday season.

**See you next year!**