July 2021

Ongoing news about MEHARRY RESEARCH

The Research Digest

ADVANCING RESEARCH AND INNOVATION • Writer/editor: Sheila T. Yong, Ph.D.

From the Meharry Medical College Office for Research and Innovation

ANNOUNCEMENTS

Upcoming/ongoing events:

- **New funding opportunities from the NIH/NHGRI.** Current due dates are **Aug 3, 2021** and **Feb 22, 2022**. Click **here** for details and pay attention to the announcement email from Dr. Anil Shanker.
- **Dual MD/MBA program by Vanderbilt and Meharry.** Click **here** to read the announcement.
- **PolicyTech to house institutional and departmental policies.** By Oct 2021, all departmental policies will begin transitioning to PolicyTech for centralized storage and engagement. Institutional policies are housed on PolicyTech beginning Jul 1, 2021. The temporary link to PolicyTech is available **here**. More details forthcoming. Please contact policy analyst **Devin Graham** or Associate General Counsel **Ronette Adams-Taylor** if you have questions.
- **Meharry School of Dentistry** established a partnership with **Eastman Institute of Oral Health (EIOH)** at University of Rochester. This partnership establishes research collaborations between the two institutes and will host lunch and learn meetings for residents, students, and faculty. Click **here** to read more.
- **Meharry - Florida A&M (FAMU) Research and Innovation Collaborative Award**

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THE VP'S COLUMN

Dear Meharrians:

During the past year, I interacted closely with faculty, students, and staff from different units and schools at Meharry. They gave me great insights into how Meharry has been shaping their careers and lives, as well as the impact our institution has on them and the community at large.

I recognize that Meharry's greatest strength is its people. Our faculty and students are innovative and entrepreneurial. Several benefited from the research opportunities through new inter-institutional collaborative initiatives that were presented to them. A faculty-student duo participated as expert panelists in The Gene Educator Series by Nashville Public Television. One medical student received the UNC Eshelman Innovation Student Award. Our graduate students were accepted into prestigious National Science Foundation Innovation Corps Program for developing the VagioMe health education platform. These are just a few examples of how Meharrians have maintained their innovative rigor despite the challenges we face during the COVID-19 pandemic.

Meharry staff also deserve our praise and gratitude. They are hardworking and exhibit unrelenting teamwork despite the paucity of resources. I am extremely pleased to work with these talented and motivated group of high achievers. Moreover, I am impressed with the strength of our educators and researchers in a diverse array of disciplines. Our ability to work across disciplines and schools makes Meharry unique. It is my goal to support the exceptional scholarship, education, and transdisciplinary approach that will transform Meharry into one of the best academic health science institutions.

I am aware of the difficulties we face, particularly in the sustainability of our initiatives and support to our faculty. We will overcome these difficulties and work aggressively to seek reliable revenue streams through endowments, partnerships, and our own innovation. I will work with our leadership, Board of Trustees, and government, as well as private industry and philanthropic organizations to devise ways to empower faculty, students, and staff at all levels to ensure their success as current and future leaders. We will expand our research and innovation enterprise. These efforts will equip Meharrians with the ability to advance knowledge, improve our quality of life, give back to our community, and contribute to our institutional economy.

As explained in the May 2021 issue of *The Research Digest*, we will focus on three priority areas: investing in intellectual transformation, establishing a state-of-the-art infrastructure hub, and creating the Innovation and Commercialization unit. First, we will implement faculty growth plans and adopt a transdisciplinary approach. This will tie in with the growth and excellence plans for our students and postdoctoral associates that will nurture their talents and prepare them to be the next-generation leaders. Next, to enrich our scientific and intellectual activities, we will establish a state-of-the-art physical, technological, and computational infrastructure that includes a secure data ecosystem and computing platforms for our research and clinical enterprises. These efforts, coupled with improved and seamless research administration processes that include the use of efficient online tools such as e-Protocol, Kuali, and iLabs, will create a vibrant research environment. Lastly, we will set up the Innovation and Commercialization unit to facilitate innovation incubation as well as manage innovation design, intellectual property, technology transfer, and industry partnering. This framework will accelerate research and delivery to maximize our positive impact on society.

Together, we will build on our successes and continue to shape Meharry's research and innovation enterprise to address local, national, and global challenges. We aim to deliver cutting-edge opportunities to underserved minorities and communities worldwide.

Best 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.

Center for AIDS Health Disparities
Dash, Chandravanu
Dong, Xinhong
Liu, Bindong
Popik, Waldemar

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.
Kalliny, Medhat
Matthews-Juarez, Patricia
Morelli, Vincent
Sanderson, Maureen

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

Graduate Studies
Actkins, Ky'Era
Pratap, Siddharth
Sakwe, Amos M.

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

Medical Dean's Office
Forbes, Digna S.
McClure, Stephanie C.

Microbiology, Immunology, and Physiology
Borza, Dorin Bogdan
Chaudhuri, Minu

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Opportunity. This is a collaborative research award for Ph.D. students, postdocs, and faculty to accelerate the development of creative ideas that will lead to discoveries and transformative changes in research and health care. Available funds: Up to **$20,000** for a student or postdoc team, and up to **$40,000** for a faculty team.

Please visit the **Meharry research** and **FAMU** websites for institutional information. To discuss potential joint projects or the award process, please contact **Leola Hubert-Randolph** (FAMU) or **Jared Elzey** (Meharry).

- The **UNC-Duke collaborative clinical pharmacology T32 postdoctoral training program** offers training opportunities for promising under-represented MD and DDS scholars as well as PhD graduates with interests in clinical pharmacology and translational research. See **flyer** for details.
- The **Department of Otolaryngology at Thomas Jefferson University** offers research fellowship opportunities. An additional scholarship to a underrepresented, minority student is also available. Admission is rolling, so please apply ASAP. See their **website** and **this announcement** for details.
- Grant development "Chalk-talk" sessions available to junior investigators to help develop their specific aims. Request your session at VP-Research@mmc.edu

Past events:

- **Jun 23, 2021: "Aging Matters: Disparities & Health Equity"** aired on Nashville Public Television on highlighted the work of Meharry's Salt Wagon Clinic and

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SPOTLIGHT

Meharry tumor immunology expert contributes to recommendations from AAI Education Committee for an undergraduate immunology course

Immunology is a vast field that encompasses many topics and concepts. Therefore, identifying the essential components of immunology and teaching them to undergraduates are crucial to their preparation for postgraduate training. Unfortunately, current undergraduate immunology courses taught across the United States lack the capacity to cover these essential concepts, and few resources are available to faculty to revamp their courses.

To alleviate this issue, the American Association of Immunologists (AAI) Education Committee commissioned an ad hoc committee consisting of undergraduate, graduate, and medical school educators as well as a biotech industry expert to address the deficiencies in these immunology courses. To do this, the committee first identified 14 key topics that are appropriate and essential for an undergraduate immunology course.

One key topic is tumor immunology. An expert in tumor immunology, Dr. Anil Shanker developed a course in tumor immunology and immunotherapy currently offered to graduate students at Meharry. As a member of this ad hoc committee, he used his experience and expertise to provide recommendations for teaching tumor immunology, which AAI adopted in its final recommendations.

The committee also identified overview concepts, terminology, and techniques that will help establish adequate background knowledge in students. Lastly, the committee expanded the key topics into various subtopics to facilitate the introduction of more detailed and advanced concepts. This approach yielded a list of topics that instructors can use to develop and modify their courses to meet the diverse needs of their students.

These improved immunology courses will help prepare students from diverse populations for careers in biomedical and health sciences. The full recommendations published in *ImmunoHorizons* (2021, 5: 448–465) are available **here**.

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Meharry and University of Memphis announce PECIR awardees

In December 2020, the University of Memphis, Meharry Medical College, and Methodist Le Bonheur Healthcare announced a collaboration to increase the number of Black primary care doctors across the state and increase research collaborations among the institutions.

As a result of this effort, the Offices of Research & Innovation at the University of Memphis (U of M) and Meharry Medical College (Meharry) created the Program to Enhance Collaborative and Interdisciplinary Research (PECIR) to stimulate innovative, interdisciplinary, team-based research between the institutions.

The inaugural PECIR Call for Applications was released in Spring 2021, followed by a virtual Lightning Talk session in April 2021. Interested faculty shared three-minute presentations about their research and research interests. In all, 37 faculty attended: 19 from UofM and 18 from Meharry.

The Lightning Talk resulted in 11 teams, led by co-PIs from each institution, applying for $50,000 each from funding contributed equally by each institution. Six were awarded:

Project title	UofM principal investigator	Meharry principal investigator
Assessing vaccine hesitancy for flu, HPV, and COVID-19 vaccines in Tennessee	Jin, Seok Won	Cunningham-Erves, Jennifer; Sanderson, Maureen
Inform future delivery of trauma-informed care in community-based HIV service organizations (CBO), faith-based organizations (FBO), the local health department (HD), and federally qualified health care centers (FQHC)	Pichon, Latrice	Brown, L. Lauren
A focus group study of the communication and educational needs of parents and patients with sickle cell disease or sickle cell trait	Young, Amanda	Mukherjee, Shyamali
Elucidating mechanisms for the sexually dimorphic response to diet-induced obesity and metabolic syndrome	Puppa, Melisa	Misra, Smita
Discovery of exosome-based molecular biomarkers for predicting prostate cancer impending metastasis	Wang, Yongmei	Chen, Zhenbang
Eliminating socially driven infant obesity disparities in minority communities of Memphis and Nashville: A community-based intervention	Antipova, Angela	Ukoli, Flora

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Liu, Bindong
Nde, Pius N.
Villalta, Fernando

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, Lloyda

Surgery
Miller-Hughes, Stephania

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*Please submit this **REDCap survey** to share news of your awards with us. We look forward to celebrating your achievements!*

student Morgan Williams, Director of the student-run clinic. Click **here** to watch the video.

- **May 22, 2021: Meharry Medical College/Vanderbilt-Ingram Cancer Center/Tennessee State University 20th Annual Symposium.** Click **here** for more information. Visit their **YouTube channel** for conference recordings. Twitter: @mctvpp
- **Apr 28–Jun 9, 2021: Workshops on diversity in clinical trials by Advanced Medical Technology Association.** For details and recordings, click **here**.

MORE INFORMATION?

Meharry Research

OfRI Services and Support Unit

Meharry Community Engagement Core

Meharry's research history

COVID-19 lab safety guidelines

ResearchPoint

Yammer

PECIR recipients have one year to build preliminary data to support external applications for continuing their work.

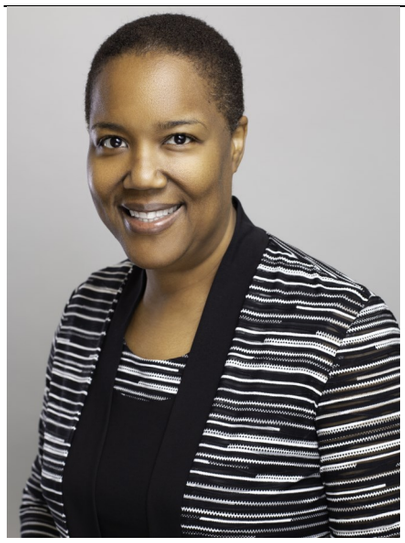
"This is the start of an exciting longer-term research partnership between our two institutions," said Dr. Jasbir Dhaliwal, Executive Vice President of Research & Innovation at U of M. "Science is inherently collaborative, and it is imperative that we pool our research capabilities to tackle the big health and medical challenges facing our communities. It is my believe that these research teams will be successful in attracting significant competitive research support from the National Institutes of Health given the focus of the projects."

Meharry's Senior Vice President for Research and Innovation Dr. Anil Shanker added, "These initial pilot research projects between Meharry and UofM faculty members will jump start promising collaborations with potential impact on health equity in the populations we serve."

Contributed by Jared Elzey

WHERE ARE THEY NOW?

MEHARRY ALUMNI SERIES



Dr. Stephanie Richardson. *Photo by Nicole Taylor.*

Dr. Stephanie Richardson's academic and professional journey came full circle when she returned to Meharry in July 2020 as an assistant professor in the Department of Professional & Medical Education.

Born in Louisville, KY, Dr. Richardson graduated from Oakwood College (now Oakwood University) in Huntsville, AL, with a BS in Biochemistry. Her research aspirations came from Dr. Ephraim Gwebu, her department chair and mentor at Oakwood. He encouraged her to pursue research early and told her about Meharry's summer research program.

Dr. Richardson got a taste of Meharry's research environment in the summer of 1994 when she joined the College's summer research program. She performed research in the laboratory of Dr. Mohit Bhattacharyya, where she learned about heart function and drug action on Purkinje fibers in the heart. "I felt at home and enjoyed meeting people from all over the world," she said. She knew then that if she came to Meharry for graduate school, she would reach her goal.

As the first in her family to pursue a Ph.D., Dr. Richardson faced tremendous stress. Concerned for her wellbeing, her parents Lawrence and Antoinette Richardson moved from Indianapolis, IN to Pulaski, TN to support her. She is also grateful for the faculty at Meharry who nurtured her as a daughter, and her classmates who saw her through her best and worst times like siblings would. "I gained a new family for a lifetime," she said.

One of her most memorable graduate school experiences is the time she prepared for her preliminary exam. She had to study from textbooks so thick and heavy that she could barely carry. For months, she shut herself in a windowless room on campus five days a week to study for her exam. During her breaks, she would talk to her professors about the subjects they lectured on. This open-door policy meant that she could seek help at any time. "At Meharry, if you are given a task, it is expected that you will succeed," she said. "There is no excuse because you will receive the support needed to accomplish the task and it is expected that you will not give up."

With Dr. Evangeline Motley after her dissertation defense in April 2004.

Dr. Richardson performed her dissertation research in the laboratory of Dr. Evangeline Motley. During this time, she was able to hone her presentation skills at lab meetings and journal clubs, as well as collaborate with faculty at Vanderbilt University. She also had opportunities to present her work and meet fellow researchers from other institutions at national conferences. Her training at Meharry adequately prepared her for her postdoctoral positions at Mayo Clinic, Vanderbilt, and Carolinas Healthcare System.

In addition to basic science research, Dr. Richardson also discovered her passion for teaching science while a graduate student at Meharry. Her experience as a teaching assistant tutoring dental and medical students aspired her to explore teaching opportunities as a National Science Foundation Graduate Teaching Fellow in K-12 Education. This fellowship afforded her the opportunity to teach at McMurry Middle School and Croft Middle School in Nashville, TN, where she encouraged students to be passionate about STEM and to seek careers in these fields. Realizing her passion for teaching science, Dr. Richardson decided to pursue her teaching licensure and later taught Biology, Chemistry, and Physical Science at Washington County Schools in Plymouth, NC.

With her parents Lawrence and Antoinette Richardson at her graduation in May 2004.

Dr. Richardson returned to Tennessee in 2014 as an Assistant Professor of Chemistry at Martin Methodist College in Pulaski, TN, where she taught undergraduate chemistry and nursing courses for almost six years. When she returned to Meharry in July 2020 to assume her current faculty position, she was overwhelmed with pride by Meharry's role in managing and conquering the COVID-19 pandemic. From the dedication of Meharrians who volunteered at the assessment site to the long lines of people seeking testing, Meharry honored its legacy of service to God and humanity in the face of extreme challenges. This sentiment sparked her desire to do more. "Many hands and hearts working together lighten the load," she said. Together with the faculty and staff at Meharry, she wants to work towards reducing health disparities, improving access to healthcare, modeling positive lifestyle changes, and training future healthcare professionals who will improve the lives of others.

As for current Meharry students, Dr. Richardson wants them to know that their success is important. She constantly strives to make a lasting impact through her teaching and mentoring. "While the challenges my students face might be different from mine, their goal to complete their degrees remain the same," she said. She wants to connect with her students and to make sure that they capitalize on all the opportunities Meharry has to offer.

YOUR ATTENTION PLEASE…

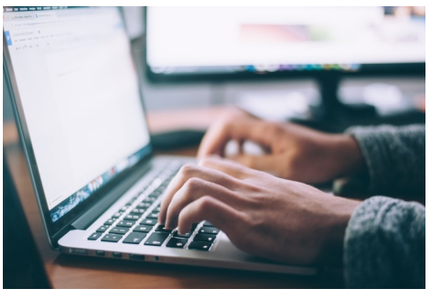


Photo by Glenn Carstens-Peters on Unsplash

Do you find yourself writing the same thing repeatedly for different documents and wondering if it is okay? Known as text recycling, this phenomenon is actually fairly common.

A recent article in *Science* on "self-plagiarism" addresses the legitimacy and concerns regarding text recycling. One thing is clear: it is not kosher to modify previously published work and then submit it elsewhere. Click **here** to read the article and to access links to recommended guidelines.

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 Dr. J. Shawn Goodwin:

Optogenetic-induced multimerization of the dopamine transporter increases uptake and trafficking to the plasma membrane. Shalonda M. Ingram, Tanu Rana, Ashley M. Manson, Faisal M. Yayah, Evan G. B. Jackson, Christopher Anderson, Benem-Orom Davids, J. Shawn Goodwin. *Journal of Biological Chemistry*. 2021 May. DOI: 10.1016/j.jbc.2021.100787

The dopamine transporter (DAT) plays an important role in regulating dopamine (DA) neurotransmission and maintaining DA homeostasis in the brain. Therefore, its function is highly sensitive to psychostimulants such as methamphetamine (METH) and cocaine. These substances induce DAT complex formation and trafficking to the plasma membrane. However, it is challenging to detect DAT complexes formation under basal conditions, thereby complicating efforts to study this phenomenon. To overcome this challenge, the authors created a light-activated fusion chimera of cryptochrome 2 and DAT (Cry2-DAT). Cryptochromes are proteins that are sensitive to blue light. Light stimulation causes Cry2-DAT to form multimeric complexes, while stimulation removal reverses complex formation. This tightly controlled system enables the study of DAT complex formation and trafficking in the absence of psychostimulants. By expressing Cry2-DAT in HEK293 and human dopaminergic neuronal-like cells, the authors verified that Cry2-DAT behaves like its native counterpart and responds similarly to METH.

From the group of Dr. Maureen Sanderson:

Maureen Sanderson, Tuya Pal, Alicia Beeghly-Fadiel, Mary Kay Fadden, Steffie-Ann Dujon, Chrystina Clinton, Cecilia Jimenez, Jennifer Davis, Mieke Fortune, Jasmine Thompson, Kiera Benson, Nicholas Conley, Sonya Reid, Ann Tezak, Xiao-Ou Shu, Wei Zheng, William J. Blot, Loren Lipworth. *Cancer Epidemiology, Biomarkers & Prevention*. 2021 May 4. DOI: 10.1158/1055-9965.EPI-20-1784

The authors of this study conducted a pooled analysis of 2,188 Black women diagnosed with breast cancer from four studies in southeastern US. Their analysis revealed the heterogeneity of breast cancer subtypes among these women, which is dependent on various reproductive risk factors. Importantly, they found that Black women who do not breastfed are at greater risk of developing triple negative breast cancer.

From the group of Dr. Donald J. Alcendor:

Targeting COVID-19 vaccine hesitancy in minority populations in the US: Implications for herd immunity. James E. K. Hildreth, Donald J. Alcendor. *Vaccines*. 2021 May 11. DOI: 10.3390/vaccines9050489

This review discusses the Pfizer/BioNtech, Moderna, and Johnson & Johnson COVID-19 vaccines, which had received emergency use authorization from the FDA at the time of writing. It also discusses factors that lead to vaccine hesitancy among people from major ethnic groups, healthcare providers, and the general population in the US, as well as ways to overcome such hesitancy.

From the group of Dr. Chandravanu Dash:

Human three prime repair exonuclease 1 promotes HIV-1 integration by preferentially degrading unprocessed viral DNA. Benem-Orom Davids, Muthukumar Balasubramaniam, Nicklas Sapp, Prem Prakash, Shalonda Ingram, Min Li, Robert Craigie, Thomas Hollis, Jui Pandhare, Chandravanu Dash. *Journal of Virology*. 2021 Jun 9. DOI: 10.1128/JVI.00555-21

The authors of this study examined human three-prime repair exonuclease 1 (TREX1), which reportedly degrades HIV-1 DNA to promote infection. They found that TREX1 is not involved in HIV-1 reverse transcription and nuclear entry. Instead, TREX1 becomes important after HIV-1 has entered the nucleus, when TREX1 also accumulates in the nucleus. Here, it degrades HIV-1 DNA that cannot integrate into host DNA. The absence of free viral DNA blinds the host toward the infection and allows HIV-1 to escape the innate immune system. Moreover, TREX1 enhances the activity of the preintegration complex (PIC), indicating its role in promoting HIV-1 integration.

JHCPU EDITOR'S PICK

Journal of Health Care for the Poor and Underserved (*JHCPU*) is a Meharry-owned and edited journal published by the Johns Hopkins University Press. It is the official journal of the Association of Clinicians for the Underserved (ACU) that focuses on contemporary healthcare issues of medically underserved communities. It publishes peer-reviewed articles on diverse areas such as health inequities, health policy, costs, barriers to care, and innovative developments in relation to underserved populations in North and Central America, the Caribbean, and sub-Saharan Africa. Recently, *JHCPU* has expanded its scope to include internally dispossessed indigenous populations worldwide. Regular features include research papers, literature reviews, policy analyses, and evaluations of noteworthy healthcare programs, as well as a column written by ACU members. Ranked 4th among 714 journals in Project Muse, *JHCPU* is widely read not only for its regular issues, but also for its supplements. Its most recent supplement on TechQuity (May 2021) was sponsored by Brigham and Women's Hospital, Vanderbilt University Medical Center, and IBM. **For more information, please contact journal editor Dr. Virginia Brennan at vbrennan@mmc.edu.**

COVID-19 and telehealth operations in Texas primary care clinics: disparities in medically underserved area clinics. Omolola Adepoju, Winston Liaw, Minji Chae, Chinedum Ojinnaka, Erin Britton, Sarah Reves, Rebecca Etz. Volume 32, Number 2, May 2021. Click **here** to read the full text.

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Texas ranks 47th among the US states in its primary care physician-to-patient ratio. Its underserved communities face significant barriers in healthcare access, leading to higher risks of disease and mortality. Due to underfunding and limited access to resources, access to primary care is severely impacted during the COVID-19 pandemic. In this study, the authors examined the use and prevalence of telehealth services at a total of 1,344 clinics in medically underserved (MUA) and non-MUA areas during the early months of the pandemic. They found that while that clinics in non-MUA areas were more likely to visits using telehealth, this difference appeared to lessen with time. These findings suggest that barriers to telehealth accessibility among clinics in MUA can resolve over time. Moreover, communities in MUA and non-MUA face some of the same barriers to telehealth accessibility, such as limited access to the Internet and computers. This study provides a basis for understanding and improving telehealth infrastructure in Texas and throughout the US.

CLINICAL & SERVICE GRANT HIGHLIGHTS

Meharry received a grant totaling **$.7.7 million** from the Tennessee Department of Health (TDH) and the Centers for Disease Control and Prevention (CDC). This grant will support the College's COVID-19 vaccination efforts in minority communities in Middle Tennessee.

Spearheaded by **Dr. Duanne T. Smoot**, interim senior vice president for health affairs, the grant will cover expenditures incurred from April 2, 2021 to June 30, 2024. Its objective are:

- Providing educational materials to minority and underserved communities in Middle Tennessee to reduce hesitancy to receive COVID-19 vaccines.
- Providing COVID-19 vaccinations to minority and underserved communities in Nashville and adjacent communities in Middle Tennessee
- Conducting a survey of people who received vaccinations to identify the frequency and types of side effects present in minority and underserved populations.

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!*

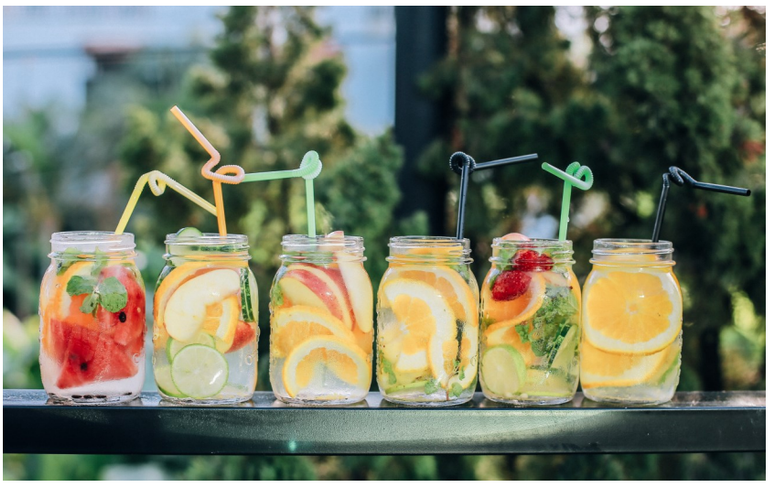

Photo by Kaizen Nguyễn on Unsplash

Summer is here!

The Office for Research and Innovation wishes all Meharrians and their families a safe and relaxing summer!