

CTSI TRANSLATIONAL IMPACT 2023

Partnering to Improve Health, Trust, and Equity in our Communities



Duke Clinical & Translational Science Institute

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Message From the Director



Duke CTSI embodies the future of health research—one that's inclusive, innovative, and impactful. Barriers exist in translating discoveries into real-world solutions, and advancements often do not reach all communities equitably. We are motivated to remove those barriers and accelerate research that improves health and achieves health equity for all. We rely on the expertise of our collaborators and partners, who span academics, community, government, and industry, as we work to cultivate a vibrant, diverse research community and better health for all.

We at CTSI are dedicated to creating a deeper connection between groundbreaking medical research and the communities we serve. For too long, clinical research has been marked by mistrust, bias, and lack of diversity. Through our partnerships and collaborative community initiatives, we are working to ensure that clinical research is representative and benefits everyone. We want every community member to see themselves reflected in our research workforce and our study populations

so that the benefits of the work that we do are directly translatable to their health.

Partnership is a unique focus for the CTSI, and we seek to strengthen existing relationships while building new ones to extend our resources, support, and expertise across and beyond Duke. We value our partners, who enrich and inform our experiences, our perspectives, and our research.

With our partners, we can:

- Identify and break down barriers through **trusted, effective, respectful, and bidirectional engagement** of our communities, patients, and collaborators.
- Create **inclusive and innovative research programs** leveraging partnerships within our communities statewide to improve health and health equity across the lifespan.
- Develop and sustain a **vital and diverse translational science workforce**.
- Foster a **vibrant, transparent, and trustworthy research environment** benefiting all.
- Create and promote a **culture of equity, anti-bias, and anti-racism** throughout all aspects of clinical and translational science at Duke.

Our **2023 Impact Report** details how these partnerships accelerate scientific discovery, innovation, and translation in ways that are aligned with our vision to improve health and achieve health equity for all.

Sincerely,

Susanna Naggie, MD, MHS

Professor of Medicine

Vice Dean for Clinical and Translational Research

Director, Clinical and Translational Science Institute

Duke University School of Medicine

Duke Clinical Research Institute

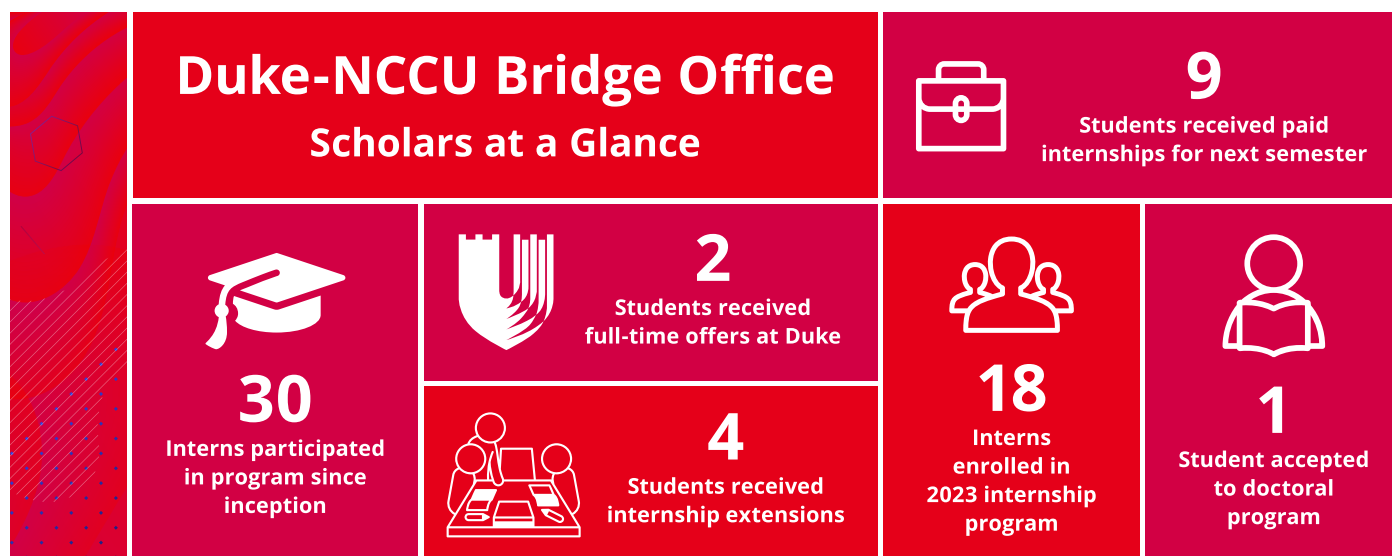
SECTION ONE

Engaging our Partners in Research

Our partners bring essential experiences, expertise, and energy to the research enterprise at Duke. We value their insights, perspectives, and novel approaches to the unique challenges related to capacity, funding, infrastructure, and equity faced by our academic, clinical, and community organizations.

North Carolina Central University (NCCU) Partnerships

More than five years into our partnership with NCCU, this remarkable collaboration has generated many successes, most notably the development of the Duke-NCCU Bridge Office, which serves as a linchpin and catalyst for the continued growth of this relationship.





NCCU student interns worked with teams in the Duke Department of Psychiatry & Behavioral Sciences and Duke Clinical Research Institute.

NCCU Students Gain Valuable Clinical Research Experience

Nine North Carolina Central University (NCCU) students presented on their internship experiences at the 2023 [Duke-NCCU Bridge Office](#) Internship Program Closing Ceremony. These scholars represented the second cohort of the program.

The internship program launched in the summer of 2022. As part of the program, the Duke-NCCU Bridge Office collaborates with various partners to provide NCCU students with work experiences in Duke offices and clinical research spaces, connections to professional development resources, matchmaking with mentors, and individualized coaching expertise. Since the program's initiation, 30 NCCU students have completed internships.

Eighteen interns in this year's program worked at Duke Psychiatry & Behavioral Sciences, Duke Clinical Research Institute Government Trials and Networks, and DCRI Research Communications and Engagement. For some students, including NCCU psychology student Deanna Floyd, these internships have been extended or led to additional internship opportunities in the fall.

"The internship program gave me the opportunity

to work with research scientists within my field of interest. It's been integral to my success as a student, and to my future endeavors," Floyd said.

Launched in 2021, the Duke-NCCU Bridge Office is designed to create multidisciplinary opportunities for collaboration between Duke and NCCU, enrich inter-professional education and workforce development opportunities for trainees, and advance clinical research by developing and supporting mutually beneficial partnerships amongst the Duke University & Health Care System, NCCU, and the communities they serve. The internship program supports this mission by providing students with professional development opportunities.

"To see the amazing growth that occurs among the students from start to finish and help build a more robust pipeline of future clinical research professionals is truly incredible," said [Lisa Davis, PhD, MSPH](#), director of operations for the Duke-NCCU Bridge Office. "Our dedicated mentors are amazing and meet each student where they are to ensure successful internship experiences. We're excited to welcome our fall interns starting next month and are already planning for summer 2024 internship opportunities."

Bryan Batch Named Faculty Director of Duke-NCCU Bridge Office

Duke CTSI welcomes [Bryan Batch, MD, MHS](#), as faculty director of the [Duke-NCCU Bridge Office](#). In this role, Batch will work closely with Duke and NCCU leadership to create opportunities for multidisciplinary collaborations and ensure that faculty, investigators, and trainees at all career levels have access to core resources and services to do innovative research.

"I'm excited by the vision of the Duke-NCCU Bridge Office to strategically align the capabilities of both Duke and NCCU to advance essential bidirectional collaborations that will enhance and support high-impact translational research," Batch said. "This is a unique partnership that is working to improve health outcomes in our communities, and I'm thrilled to lead the work of this office as we support initiatives to diversify the future clinical research sciences workforce, build new research teams, and expand infrastructure to support underrepresented minority researchers."

Batch will join bridge office team members Lisa Davis, PhD, MSPH, director of operations; Faye Calhoun, MS, DPA, special assistant to the chancellor at NCCU; and Health Equity Researcher Undi Hoffler, PhD, director of Research Compliance and Technology Transfer at NCCU.

A skilled clinician scientist, academic leader, adult endocrinologist, and mentor at Duke University Health Center and the Durham VA, Batch has deep connections with collaborators in the community of Durham and NCCU, including the Durham County Health Department, Lincoln Community Health Center, REACH Equity Stakeholder Advisory Board and a

variety of NCCU researchers. Batch's multidisciplinary research has been highlighted in more than 70 peer-reviewed papers and collaborations on several current NIH-funded grants.

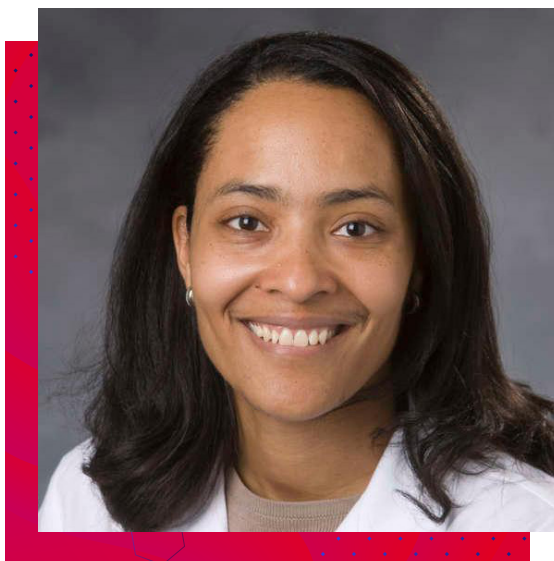
"Dr. Batch is deeply committed to ensure that the Duke-NCCU Bridge Office strengthens ties between

Duke and NCCU and serves as a local and national example of a highly successful collaborative partnership," said [Susanna Naggie, MD, MHS](#), director of Duke CTSI.

Batch has served as the vice chief of diversity, equity, and inclusion for the Division of Endocrinology since 2021. She has extensive experience mentoring students and trainees, including Duke endocrine fellows, residents, and medical and undergraduate students.

As faculty director, Batch will work collaboratively to envision, develop, and champion evidence-based programming. She will support researchers, students, and trainees to conduct collaborative, boundary-spanning research at Duke and NCCU. Her work will include co-developing a strategic plan for the office, engaging Duke faculty to participate in grant opportunities with NCCU faculty, and supporting pathways to clinical and translational research careers for underrepresented minor students and trainees.

"Given her leadership history, collaborations with multiple CTSI faculty, her focus on sustainability and her innovative and thoughtful approach to collaboration, I am confident that Dr. Batch will do wonderfully in this position," said [Joseph McClernon, PhD](#), chair of the search committee and associate director of the Duke CTSI.



Bryan Batch, MD, MHS

Case Study: Collaboration Across Campuses: The NCCU Clinical Research Sciences Program

The lack of a diverse workforce in clinical research negatively impacts health outcomes and equity in clinical trials, healthcare, and medical practices.

The Clinical Research Sciences Program (CRSP) leveraged the partnership between North Carolina Central University and Duke University to create an environment for producing a highly trained and diverse workforce in clinical research.

As of May 2023, the certificate program has graduated 33 students, and the bachelor's program has trained 8 students. To date, 18 graduates of the certificate program now hold positions as clinical research professionals. Seventeen of these graduates have been promoted in their jobs since graduating the CRSP program.



Community Partnerships

Community partnerships have been a longstanding focus for the CTSI, serving as an exemplar for Duke engagement with the community.

Colorful Mural Highlights Duke's Commitment to Community-Engaged Research

Neighbors, community health exhibitors, and local vendors gathered under a huge tent at a Duke research site in July 2023 to celebrate the unveiling of a mural that highlights the rich diversity, cultural heritage, and collective spirit that makes the Durham community so unique.

The free, public event drew a large crowd and featured delicious food, festive music, and many opportunities to learn more about health and wellness resources and services available to local community members.

The stunning mural has transformed a 34-foot wall into a work of art and symbolizes the mission of the [Research Equity and Diversity Initiative \(READI\)](#), a large effort focused on collaboration and engagement with the local community on health research that is important and relevant to people's lives.

Community-Driven Research

Part of Duke Clinical and Translational Science Institute (CTSI) and funded by The Duke Endowment, READI seeks to improve health and advance health equity by



Together for Resilient Youth (TRY) Director Dr. Wanda Boone (second from right) poses with mural artist Max Dowdle (center) and friends.

to ensure trust in research and increase broad representation in research participation and workforce.

The mural covers an entire wall at [Duke Research at Pickett Road](#), a facility that READI opened in 2021 to provide space, staffing, and resources for clinical research and community engagement opportunities. This unique, freestanding site aims to support high-quality clinical research at Duke by providing a comfortable and accessible space and an efficient, diverse, and inclusive research team, as well as a place for community activities, meetings, and trainings.

making it easier for community members and researchers to work together on relevant health research.

This community-based approach relies on the guidance and advice of the [READI Community Advisory Council](#), which includes study participants, healthcare providers, patients, and community and faith leaders. Through this essential collaboration, READI is working

Community-Driven Design

The colorful and compelling mural, designed by [artist Max Dowdle](#) and informed and painted by the community, graces the READI Community Room and invites visitors to explore the many themes threaded throughout the artwork. The mural features the Duke University, North Carolina Central University, and



Scenes from the unveiling event for the mural that highlights the rich diversity, cultural heritage, and collective spirit that makes the Durham community so unique.

Durham Tech logos.

The mural creates a positive environment where members of the wider Durham community feel welcome and represented. Applications for the mural project were open to all professional artists or teams of artists, and local, regional, and North Carolina-based artists were specifically encouraged to apply. Applicants were asked to submit proposals designed for the location that:

- Represented the vibrant nature of the greater Durham community.
- Highlighted health and healing.
- Amplified the importance of equity, diversity, and community engagement in clinical research.

Dowdle, director of [NC Public Art](#), submitted the winning application. He designed the mural in collaboration with the READI Community Advisory Council and community members who have been intimately involved in the project. Dowdle synthesized feedback from the community into a lasting work of art, created by many people who painted under his guidance.

READI Director [Susanna Naggie, MD](#) is committed to a long-term partnership with the community and maintaining connections beyond the walls of the Duke Research building. READI is focused on listening to community members and inviting them to tell researchers which diseases are important to them.

“That’s when we know that we’ve made some real change,” Naggie said.



AME Zion HEAL Partnership Creates Model to Address Advance Care Planning

Throughout history, Black Americans have faced unequal treatment across societal institutions. From slavery to the Civil Rights Movement and beyond, the church has been critical to advocating for social change and equality in the Black community,

and the AME Zion Church has been and remains front and center.

As a trusted institution with broad reach and a history of leading efforts to prevent disease and promote health, the church is critical to addressing barriers to

spiritual, emotional and physical well-being that disproportionately affect Black people due to systemic and structural racism. The [AME Zion HEAL \(Health Equity Advocates and Liaisons\) partnership](#) works to dismantle racism and reduce inequities in health and healthcare for Black communities in North Carolina by providing access to resources to improve health and increase participation in biomedical research. The partnership includes a network of 18 faith leaders representing 17 African Methodist Episcopal Zion churches across North Carolina.

Three years ago, Nadine J. Barrett, PhD, who founded CTSI's [Center for Equity in Research](#), and [Kimberly S. Johnson, MD, MHS](#), joined forces with AME Zion HEAL to improve serious illness care. Based on previous research, Black people with serious illnesses are less likely to discuss their wishes for end-of-life care for family members or doctors; receive care consistent with their preferences; receive adequate management of pain and other symptoms; and access hospice and palliative care services.

"I thought, 'Is this a barrier related to preferring to leave these decisions in God's hands?'" Johnson said during [her Dean's Distinguished Research Series presentation in April 2023](#). "I then thought, 'Why can't we bring this kind of education into the community?' Specifically, in churches where people could learn about these things before they actually needed them."

To address these disparities, Duke investigators and research staff worked with AME Zion HEAL clergy and health ministry leaders to create Equal SPACE (Spiritual and Faith-Based Advance Care Planning and Palliative Care Education), a national model to increase awareness and access to information and resources

related to serious illness and end-of-life care. The collaboration is funded by a grant from the Arthur Vining Davis Foundation.

Developed with input and expertise provided by congregants and faith leaders through focus groups and surveys, Equal SPACE addresses several barriers to high quality palliative and end-of-life care for Black patients, including access to trusted information in safe spaces, resources to complete advance directives, comfort discussing death and dying, opportunities to learn from the experiences of peers, and strategies to improve communication with healthcare providers.

"Black people don't like to talk about dying," a focus group participant said. "We need to talk about hospice. A lot of people don't know what hospice is, they think it's just there for cancer patients. A lot of people don't know what palliative care is. It needs to start in the church. I think [Equal SPACE] will bring the education that is needed."

Among 610 congregants who completed surveys across 17 AME Zion Churches as part of the project, the majority of respondents had not discussed preferences for end-of-life care with their doctor, family, or friends, and many had little knowledge of advance care planning, hospice, and palliative care.

The Equal SPACE curriculum will launch in spring 2023. The curriculum includes four modules and covers advance care planning, hospice care, palliative care, and estate planning. Based on the results in North Carolina, the team looks forward to disseminating the program nationally in the future.

For more information about Equal SPACE, contact Alesha Majors at alesha.majors@duke.edu or the Rev. Shellena Atlas at shellena.atlas@duke.edu.

Keisha Bentley-Edwards Presents Research on Racial Health Disparities

Keisha Bentley-Edwards, PhD, co-director of Duke CTSI's [Integrating Special Populations](#) and [Equity in Research](#) cores, presented her research in racial health disparities as part of the Duke School of Medicine's [Dean's Distinguished Research Series](#).

During her presentation, Bentley-Edwards discussed how racial health disparities act as social drivers of health. Her research examines how things like religiosity and spirituality impact the health of African Americans.

Through her research, Bentley-Edwards has looked at resiliency in response to stress around racism. Resiliency is defined as a person's positive adaptation after exposure to a significant threat of severe adversity. She said this concept often romanticizes struggle, particularly when it comes to people of color.

"There's an assumption that resiliency is common, that it's just a natural response to adversity, but there are problems in how it's measured," Bentley-Edwards said. "We have to believe that we can help people who have experienced adversity live better lives. However, I do feel like there are problems in the way that we have executed the conversations about resilience."



Keisha Bentley-Edwards, PhD

To understand the racial health disparities seen today, Bentley-Edwards said it is important to understand the historical context, including the foundation of race correction in medicine in the 1800s.

Additionally, she discussed how things like the Flexner Report on U.S. medical education led to standards in medical care and training that shuttered historically

Black hospitals and perpetuated systemic racism in the medical community.

"There have been estimates that if the five hospitals that were shut down as a result of the Flexner Report were still functioning, we'd have approximately 30,000 more Black doctors in this country," Bentley-Edwards said. "This has implications for care, especially when we start talking about racial correlations between patient and provider."

In conclusion, Bentley-Edwards said the biggest reason why these issues persist is because they seem like such big problems, requiring everyone to work together to solve them.

"This heavy health burden faced by Black people is not accidental," she said. "It's not an act of God. It's part of a system. And if it was created by a system, that means that we can disrupt that system."

Ten Community Organizations Earn 2023 Dean's COVID-19 Community Grants

Ten community-based organizations were selected as grant recipients for the Dean's COVID-19 Community Education and Outreach to Advance Health Equity program in 2023. The initiative is a collaboration with the Duke University School of Medicine and CTSI's [Center for Equity in Research](#) and [Community Engaged Research Initiative \(CERI\)](#).

"This grant program amplifies and recognizes the capacity and strengths of our community organizations to develop and implement their own RFA and support community-led interventions that maximize impact and serve our communities to reduce the burden of COVID-19 and other chronic diseases," said Nadine J. Barrett, PhD, who created the Center for Equity in Research. "It's a new way for Duke to think about and trust community colleagues and partners."

Led by Barrett and supported

by Leatrice Martin, senior program coordinator for CERI, the goal of this grant program initiated in 2021 is to provide funding to amplify community organizations' expertise, impact, and reach to address COVID-19 health disparities.

"These awardees represent how community organizations can have a powerful, sustainable, and positive impact on the health and well-being of those communities in greatest need," said [Julius Wilder, MD, PhD](#), co-director of CERI. "The COVID-19 pandemic taught us the importance of trusted messengers embedded in communities when it came to vaccine distribution as well as providing timely and accurate health information throughout the community. These lessons learned will help us advance health equity by addressing other diseases and chronic conditions such as diabetes, hypertension, and colon cancer."



The 2023 awarded projects and institutions were:

Project: Stay Fit for Life Community Gardening

Organization: The Tabernacle of Redeeming Faith Ministries

Project: Blue and White: Supporting Communities Through COVID-19

Organization: Zeta Phi Beta Sorority, Inc.

Project: Faith and Prevention: Reducing Impact of COVID-19 Through Faith-based Chronic Disease Prevention Programs

Organization: Balm in Gilead

Project: Addressing Health Disparities in Communities of Color in Durham Through Radio and Community Engagement

Organization: WNCU Radio

Project: Test Yourself Protect Your Community

Organization: Grace Helping Others

Project: Healthy23

Organization: The Juice Network

Project: Roc the Vax

Organization: Shackle Free Community Outreach Agency, Inc.

Project: Healthy Latinx Neighborhoods/Vecindarios Latinos Saludables

Organization: Inglesia La Semilla

Project: Poof Center: Community Health Support

Organization: POOF Center

Project: The GUT Patrol Health Fair

Organization: The Connection Place, Inc.

Duke Partnerships

CTSI is a Duke University-wide institute known for collaborating to catalyze innovation and leading initiatives with partners for novel approaches to clinical and translational research and translational science.



New Center for Precision Health Aims to Transform Population Health, Patient Care

The Duke Clinical and Translational Science Institute (CTSI) is pleased to announce the launch of the [Center for Precision Health \(CPH\)](#), a collaboration that will harness the power of genomic,

biomarker, and health data to transform patient care and population health.

The Duke University School of Medicine has a rich history of translational discovery science leveraging

genetics, genomics, and other omic technologies coupled with data science and informatics. With continuing advances in genomics, biomarker technology, and computational biology alongside improvements in electronic health records and machine learning, the CPH will work to bridge discovery science with personalized patient care.

"This collaborative effort will bring together researchers from across Duke that will enable us to improve

the essential components needed to transform how we view and use data to care for our patients and improve the health of our communities. The work of this center aligns with the strategic priorities of our institute and the health system overall.

This new center will fuel clinical, translational, and basic science and serve as a foundational network for coalescing the Duke scientific community. The CPH aims to expand genetic discovery and catalyze clinical genetics care, conduct clinically impactful translational research, perform cutting-edge implementation science, engage the community and build trust, and educate the precision health workforce of tomorrow.

The CPH has five programs to enable these goals: population genetics, translational discovery, implementation science, community engagement and ethics, and precision health education. The center will also serve as the scientific and op-



Svati H. Shah, MD, MHS, and Julie Eckstrand, RPh, lead the new Center for Precision Health.

erational home for [OneDukeGen](#), a genomic medicine research study and biorepository that will perform genetic sequencing on 150,000 Duke Health patients and research study participants and will return clinically actionable genetic test results so they may make informed decisions about their health. The CPH will also house the [Duke Kannapolis clinical research site](#) and the [MURDOCK Study population-based cohort](#).

patient care and help move more discoveries in basic and translational research into clinical care," said [Mary E. Klotman, MD](#), executive vice president for health affairs and dean of the School of Medicine. "The Center for Precision Health is poised to become a powerhouse for genetic and genomic discovery, outreach, and education. I'm excited to see what the future holds."

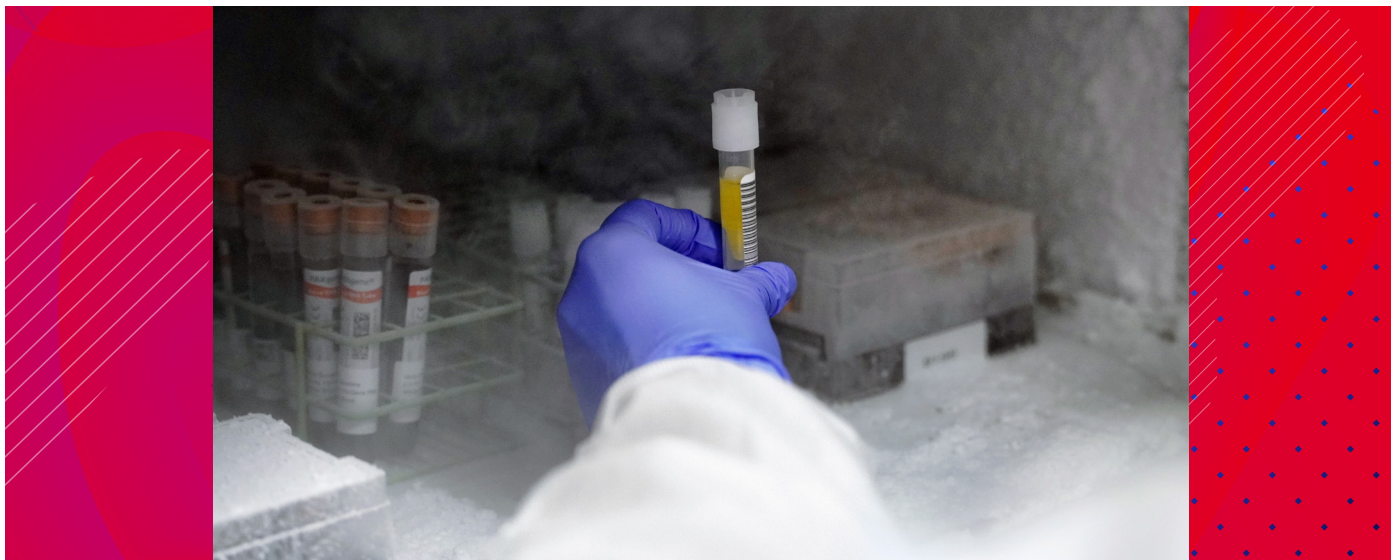
[Svati H. Shah, MD, MHS](#), Ursula Geller Distinguished Professor of Medicine, has been named director of the CPH. [Julie Eckstrand, RPh](#), will serve as executive director.

"The Center for Precision Health brings together all the essential components needed to transform how we view and use data to care for our patients and improve the health of our communities," said Duke CTSI Director [Susanna Naggie, MD, MHS](#). "The work of this center aligns with the strategic priorities of our institute and the health system overall."

The Center for Precision Health brings together all

The center will have strong ties to the Duke School of Medicine [Precision Genomics Collaboratory](#) and [Duke AI Health](#) and will collaborate closely with basic science and clinical departments within the school and with the Duke Health System.

"We are so excited about launching the Center for Precision Health," Shah said. "This will unite many different aspects of precision health, with a focus on research that has impact for Duke patients. This will necessitate multi-disciplinary teams and highly collaborative science."



Duke School of Nursing, CTSI Collaborate to Advance Research in Health Equity

Through a collaboration designed to advance research in health equity and social drivers of health, the Duke Clinical and Translational Science Institute (CTSI) and the Center for Precision Health have partnered with the Center for Nursing Research at the Duke University School of Nursing (DUSON) to bring more than 20,000 biological samples and linked data from a community-based registry at [Duke Kannapolis](#) to investigators at DUSON.

The new DUSON-MURDOCK Biorepository includes de-identified samples and associated data from nearly 12,000 racially and ethnically diverse participants in the [Kannapolis Population Based Cohort](#), a longitudinal cohort based at CTSI's research site in Kannapolis.

"We are thrilled to make thousands of biospecimens and associated clinical and outcome data available to the School of Nursing through this science-forward collaboration," said [Svati Shah, MD, MHS](#), who directs Duke Kannapolis and the [Center for Precision Health](#). "This partnership is exactly what we envisioned when we created our biorepository initiative with the intention to share this powerful resource

with more Duke collaborators."

The [Biorepository Transformation Initiative](#) is available to all Duke researchers, who can complete [this brief interest form](#) as a first step toward accessing samples. DUSON is well and uniquely positioned to tap into this initiative to create a local biorepository to facilitate biomarker research to support their strategic priorities in health equity, social drivers of health, and nurse-led models of care.

"We are excited to test hypotheses exploring how social and contextual experiences can be embedded in our biology and thus our health. Understanding how these experiences impact health is a key piece of our strategic plan for research," said [Sharron L. Docherty, PhD, PNP, RN, FAAN](#), vice dean for research at DUSON. "Thanks to the sample size, diversity, and the number of chronic health conditions present across this data set, we can explore vital questions related to how the environment influences biology."

Researchers at DUSON will use their DUSON-MURDOCK Biorepository in two relatively new areas of research: social epigenetics, or how social experiences become embodied in humans and can impact health

in positive and negative ways, and social genomics, or how fixed biological traits underpin health outcomes that are influenced by social factors, such as stress.

“Duke Kannapolis will be a valuable collaborator as we explore ways to use these biospecimens to better understand how a genetic predisposition for a health outcome may be modified by social factors, and in turn, how social factors may become genetically embedded in humans, changing biological function,” said

[Julia K.L. Walker, PhD](#), director of the DUSON-Biomarker Laboratory. “The database is a remarkable resource.”

[Kais Gadhoumi, PhD](#), assistant research professor at DUSON, will lead informatics and data management on the project. Duke Kannapolis leadership on the project includes [Julie Eckstrand, RPh](#), executive director for scientific programs, and [Douglas Wixted, MMCI](#), research program leader.

About Duke Kannapolis

A part of the Center for Precision Health within the Duke CTSI, Duke Kannapolis functions as an engine to accelerate precision genomics and population health research, featuring a diverse community of engaged research participants and supporting the Duke research community and external collaborators and partners. Learn more about [Duke Kannapolis](#) and the [Kannapolis Population Based Cohort](#).

About Duke CTSI

The Duke Clinical and Translational Science Institute (CTSI) catalyzes and accelerates the innovation and translation of scientific discoveries into health benefits for patients and communities through collaborative research. Our NIH Clinical and Translational Science Award (CTSA) funding enables us to offer programs, project management and navigator services, and data

sharing and informatics resources that provide essential support to move ideas from the laboratory through early-phase clinical trials and facilitate education for current and future translational medicine researchers. Learn more about [Duke CTSI](#).

About Duke University School of Nursing

[A diverse community of scholars and clinicians](#), Duke University School of Nursing (DUSON) is educating the next generation of transformational leaders in nursing. We advance nursing science in issues of global importance and foster the scholarly practice of nursing. The U.S. News and World Report have ranked us second in the nation for its 2023 Best Nursing Schools rankings. The School offers Master’s, PhD, and Doctor of Nursing Practice degrees and an Accelerated Bachelor of Science in Nursing degree to students who have previously graduated from college. Learn more about [DUSON](#).



Adam Goode, PT, DPT, PhD, (back row, third from right) and BACK study team members from Durham and Kannapolis kick off the study at Duke Kannapolis, CTSI's site on the North Carolina Research Campus. The Kannapolis team is led by Julie Eckstrand, RPh (front row, second from left). Photo by Duke CTSI.

Duke Ortho, CTSI Launch Five-Year Pain Study

Duke Orthopaedic Surgery and Duke CTSI are collaborating on a five-year pain research project led by [Adam Goode, PT, DPT, PhD](#), who has been awarded a \$3.3 million competitive renewal (R01) grant funded by the National Institutes of Health.

The Biomarkers to Advance Clinical Phenotypes of Low Back Pain (BACK) project will build on a successful [pilot study](#) completed by Duke Ortho and CTSI in August. Like the pilot, recruitment for the BACK study will take place in Durham and Kannapolis, where CTSI operates the [Duke Kannapolis research site](#) on the North Carolina Research Campus.

"We are thrilled to collaborate with CTSI's Duke Kannapolis team again. Their expertise in community-engaged research is vital because we want this study to reflect the community," Goode said. "Throughout the previous study, we became interested in learning more about how people transitioned from having an acute episode of low back pain to chronic low back pain."

The BACK project aims to identify a risk phenotype of biological, psychological, and social factors for up to 480 patients in the community with acute low back pain. The risk phenotype predicts the transition from acute to chronic low back pain.

Along with examining other factors that lead to chronic lower back pain, the BACK project aims to determine the role of inflammation and whether regulating inflammation in the acute phase can prevent the transition to chronic pain. Low back pain is among the most prevalent musculoskeletal conditions in the world and a leading cause of disability.

[Svati Shah, MD, MHS](#), Ursula Geller Distinguished Professor of Research in Cardiovascular Diseases, directs Duke Kannapolis and is a co-investigator for the BACK project. Duke Kannapolis and [Julie Eckstrand, RPh](#), executive director for scientific programs, recently hosted Goode and his team in Kannapolis for a kickoff event.



The fireside chat with Mary E. Klotman, MD, executive vice president for health affairs at Duke University and Robert M. Califf, MD, commissioner of the U.S. Food and Drug Administration was a highlight of the event.

[National Forum on Health Misinformation Fosters Learning Network](#)

Duke CTSI partnered with the Duke University School of Medicine, RTI International, and the Coalition for Trust in Health and Science to develop a national event to elevate trusted voices and support accurate content in response to the spread of inaccurate information related to medicine and health.

Held in November at RTI headquarters in the Research Triangle Park, the National Forum on Best Practices to Address Health Misinformation: Healthcare Readiness and Response fostered a learning network of organizations interested in implementing targeted approaches to mitigating the spread and effects of medical misinformation, as well as curating best practices

for healthcare organizations and their partners.

The event featured a fireside chat with Mary E. Klotman, MD, executive vice president for health affairs at Duke University and dean of the School of Medicine, and Robert M. Califf, MD, commissioner of the U.S. Food and Drug Administration and a former longtime Duke professor and vice chancellor.

A persistent concern throughout American history, medical misinformation and mistrust have surged and flourished during recent events including the COVID-19 pandemic, creating a dilemma for many healthcare leaders. In 2021, the U.S. Surgeon General issued a warning that health misinformation poses a

threat to public health and wellbeing.

In March, 50 national organizations launched the Coalition for Trust in Health and Science to combat misinformation and help Americans make science-based health decisions for themselves, their families, and

their communities. Also this year, the FDA launched a Rumor Control page to debunk persistent confusion and help stop the spread of misinformation that is putting patients and consumers at risk.



Duke Health employees who have recently been tested for COVID-19 may be eligible for a new study managed by CTSI's team at Duke Kannapolis.

Duke Launches Site for COVID Vaccine Study Among Health Care Workers

The [Duke Clinical and Translational Science Institute \(CTSI\)](#) is collaborating with the Duke Department of Emergency Medicine on a study to evaluate the effectiveness of COVID-19 vaccines and the long-term impact of infection among health care personnel.

CTSI's research site at [Duke Kannapolis](#) oversees and manages recruitment and enrollment for the project at Duke, one of 20 sites nationwide for the

public health surveillance project dubbed [Preventing Emerging Infections Through Vaccine Effectiveness Testing](#), or PREVENT II. Anyone who works at a Duke Health location and has recently been tested for COVID-19, whether positive or negative for infection, may be eligible to participate.

[Duke Emergency Medicine](#) is partnering with the U.S. Centers for Disease Control and Prevention (CDC) and the University of Iowa on the study.

“Duke is a part of an important national initiative to really understand the effectiveness of COVID vaccines and boosters and to promote public health interventions to help prevent future pandemics,” said [Stephanie Eucker, MD, PhD](#), assistant professor of emergency medicine and site investigator for PREVENT II. “Duke has the infrastructure to make this happen, and that is part of the reason we could get the project up and running so quickly.”

PREVENT II will enroll at least 600 Duke Health employees in the coming year. Eucker, a pain researcher focused on health equity and improving public health, said the COVID-19 initiative interested her as an epidemiological study of vaccine status, infection rates, and outcomes in health care personnel, who represent the overall population.

She credited the Duke Kannapolis team, which has [recruited more than 14,000 community members](#) in Cabarrus County for clinical research studies since 2008, with the experience and expertise to launch PREVENT II for Duke.

“They have been very systematic and organized, with great attention to detail. Accuracy is paramount, and they are totally tenacious with acquiring data and following up,” Eucker said. “Everything I needed them to do, they had experience in. The study is in good hands.”

The University of California, Los Angeles (UCLA) leads the two-phase PREVENT initiative. PREVENT I was among the first to demonstrate the [real-world benefit of mRNA vaccines](#) in preventing symptomatic infection. PREVENT II, co-coordinated with the University of Iowa, examines the effectiveness vaccines and boosters, including those authorized for specific virus variants.

“We are thrilled to collaborate with Duke Emergency Medicine,” said [Julie Eckstrand, RPh](#), executive director of Scientific Programs at Duke Kannapolis. “Dr. Eucker’s team did extensive technical groundwork, and our team was able to jump in with both feet. This is the kind of project made for Duke Kannapolis, where we take pride in working hard and conducting studies with excellence.”

[Carla Kingsbury](#) is the lead coordinator for PREVENT II for the Duke site, and [Micki Rockett](#) is a study coordinator. Both are based at Duke Kannapolis. Karina Goicochea with Duke Emergency Medicine is also a study coordinator.

Duke Health employees who are tested for COVID through work will automatically receive an email to join the project. Duke Health employees who test for COVID at home also may qualify. To learn more, contact prevent2@duke.edu.

New Office to Advance Community-Engaged and Research-Practice Partnerships

The Social Science Research Institute (SSRI) and the Duke Clinical and Translational Science Institute (CTSI) together have launched a new office focused on utilizing evaluation and associated responsive and community-engaged research to improve practices and augment impact.

The [Office of Evaluation and Applied Research Partnership](#) will serve as a coordinated and interdisciplinary hub that unites foundational work underway at SSRI and CTSI. In particular, the office aligns SSRI's Applied Research, Evaluation, and Engagement team with CTSI's Evaluation and Strategic Planning team.

The office will facilitate leadership in evaluation and associated research partnerships across the university, provide a mechanism to offer specialized expertise to university and community entities, and work to advance multiple aims in Duke's larger strategic plan. The latter includes supporting research development, fostering equitable community engagement, and augmenting teaching and learning opportunities.

"This office's ability to draw on and bring together diverse disciplinary bases across both the social and clinical and translational sciences has the potential to build critical learnings to inform research and evaluation practice, ultimately improving society," said Susanna Naggie, MD, MHS, director of Duke CTSI and associate professor of medicine and vice dean for clinical research for the School of Medicine.

Don Taylor, SSRI faculty director and faculty in the Sanford School of Public Policy, agreed and said, "This exciting partnership joins expertise from across Duke to

provide actionable results from high quality evaluations of innovative programs. This collaboration will allow Duke to better integrate social science knowledge into research projects to yield results that are relevant for public policy."

Activities within this office will focus on partnering with campus, health system, and community initiatives to develop and implement 1) evaluation and associated responsive/community-engaged research efforts; 2) capacity-building and learning opportunities; and 3) advances and applications of evaluation and related applied and community-partnered research.

The office is led by [Jessica Sperling, PhD](#), who leads both CTSI and SSRI groups that this office unites. "This office owes its existence to Dr. Sperling's vision and is a product of her expertise and knowledge in the areas of evaluation, community engagement, and equity," said Joe McClernon, PhD, CTSI co-director for Integration and Strategic Partnership and faculty in Psychiatry and Behavioral Sciences. "She's built fantastic teams at CTSI and SSRI, and we're excited to see where their combined vision, talent, and energy can lead."

Ed Balleisen, PhD, vice provost for Interdisciplinary Studies, is excited for what this new initiative will accomplish. "I view this office as extending a critical mechanism to build bridges across disciplines, to deepen Duke's partnership with external organizations, and to extend our capacity to leverage Duke's research expertise to address societal imperatives."

To learn more, [visit the website](#). To request a consultation or discuss potential partnership, email oeerp@duke.edu or [complete this form](#).



SECTION TWO

Accelerating Research Innovation

Duke is a national leader in health informatics, data science, and AI, and Duke CTSI is a primary resource for these efforts in collaboration with Duke AI Health. As the academic research and community engagement lead for the reference partnership, CTSI serves as a liaison for Duke faculty and the community to invest in research innovation.

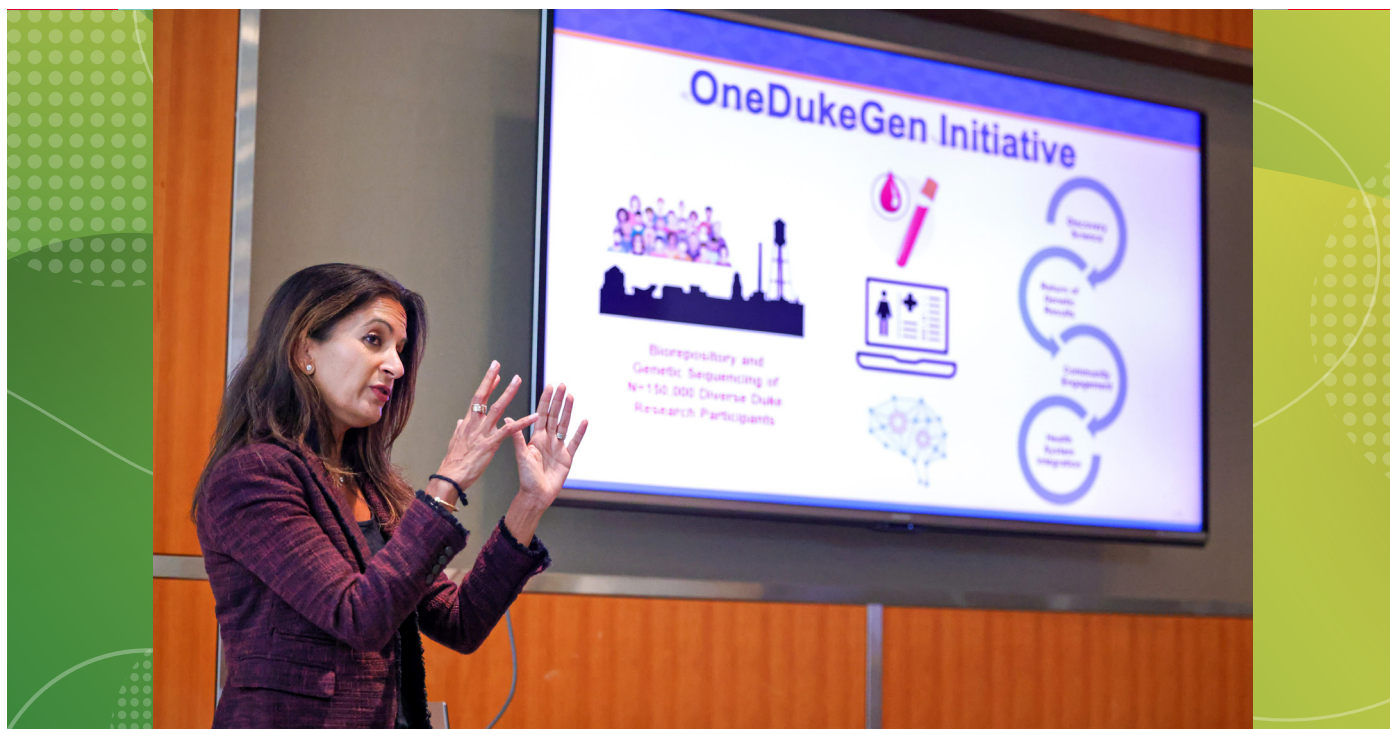


Dean Mary E. Klotman hosted many CTSI leaders during her video series in 2023, including Faculty Associate Director Kanecia Zimmerman, MD, PhD.

CTSI Leaders Discuss Impact in Dean's Video Series

As part of her ongoing Friday Message video series, Duke University School of Medicine Dean Mary Klotman, MD, hosted many CTSI leaders in 2023 to talk about the impact of their work — and Duke's work more broadly — on health and health equity.

The conversations covered artificial intelligence, vaccine research, health care access in underrepresented populations, medical misinformation, and more. [Enjoy the videos, which start as the conversations with the Dean begin.](#)



Svati Shah, MD, MHS, leads the OneDukeGen initiative.

Heartfelt Gratitude: Duke Patient Contributes to OneDukeGen Study

By the time Roger Neighborgall was 66 years old, his heart was wearing out. Without an effective way to pump blood through his body, Neighborgall was experiencing circulatory problems and suffering heart failure.

He had been told he had up to a month to live, but in January 2021, Duke University Hospital provided him with a new lease on life—a heart transplant.

Three years later, Neighborgall is thriving and looking to give back to the place that gave him the most precious gift of all: time.

“You get a sense of connection [having] somebody else’s heart in your chest,” he said, “and I feel an overwhelming sense of connection with Duke.”

So when Neighborgall was asked during a recent transplant checkup if he would consider joining [OneDukeGen](#), a precision medicine study that will analyze DNA from 150,000 consented Duke patients, he didn’t hesitate. “Before it even came out of their mouths,”

Neighborgall said, “I knew I was going to join.”

As part of the new [Center for Precision Health](#) and in partnership with [nference](#), a science-first software company, OneDukeGen will use genetics and precision medicine to make scientific discoveries focused on improving the health and well-being of Duke patients.

“OneDukeGen is focused on using genetic and other scientific discoveries and translating them to patient care in less time,” said [Svati Shah, MD](#), Ursula Geller Distinguished Professor of Research in Cardiovascular Diseases and principal investigator for OneDukeGen. “Because of participants like Roger, we will be able to make discoveries to improve prevention and treatment of diseases and enhance health.”

Eligible Duke patients will receive an invitation to join the study either during a previously scheduled appointment or through their Duke MyChart portal. Recruitment will be ongoing over the course of the six-year study. Participation is currently limited to established

Duke patients.

Once enrolled, participants will provide a blood or saliva sample. Researchers will then be able to analyze DNA, RNA, and other factors to investigate a variety of diseases and conditions. Participants will receive their genetic testing results if they have DNA differences that increase the risk for preventable or treatable health conditions. They may also receive recommendations for follow-up care, such as annual screenings,

medication, or preventative surgeries.

Neighborgall often thinks of all the people at Duke who have helped him on his journey. "I owe them so much, and if some of my DNA can help not only at Duke Hospital but maybe, in the future, other hospitals, of course I've got to be part of it."

[Visit the website](#) to learn more about the On-eDukeGen study and how Duke patients will be invited to participate.



Bruce Sullenger, PhD, recipient of the 2018 Duke CTSI Transformative Award.

CTSI Pilot Award Helps Researchers Develop New Intervention for Stroke Patients

According to the Stroke Awareness Foundation, about 795,000 people in the U.S. alone suffer a stroke each year, and every four minutes someone dies from a stroke. When it comes to detecting and treating strokes in patients, every second counts.

To date, the only effective type of intervention for ischemic stroke patients has been revascularization, which refers to medical treatments that restore blood flow to a body part or organ when that flow has been

limited or blocked. Stroke patients receive this intervention through medication – thrombolytics – or an endovascular thrombectomy, a minimally invasive surgery to remove blood clots from blocked arteries in the brain.

To receive these treatments, stroke patients must be diagnostically evaluated in time. That means patients must identify that they are experiencing a concerning medical episode and get themselves to the

hospital for diagnosis in under four hours. As data shows, this is extremely difficult to achieve – about 85 percent of stroke patients do not arrive to hospitals in time for intervention.

Currently, there are FDA-approved drugs that work to address this issue, such as a tissue plasminogen activator (tPA), which helps dissolve blood clots and restore blood flow to the brain. The problem with tPAs is that they can lead to a high risk for bleeding complications.

“It’s like sending an angry email out that you can’t pull back,” said [Bruce Sullenger, PhD](#), Joseph W. and Dorothy W. Beard Distinguished Professor of Experimental Surgery at the Duke School of Medicine. “Doctors always seek to ‘do no harm,’ but at the same time you have to stop the blood clotting. We wanted to come up with a way to give clinicians more control and ‘pull the email back.’”

Working Toward a Better Solution

With this goal in mind, Sullenger and his lab have been developing a more potent, rapidly reversible antiplatelet agent for patients suffering from acute ischemic strokes. This type of stroke is the second leading cause of death globally, and adults today have a global lifetime risk of 18 percent for these strokes.

In the early stages of their research, Sullenger’s team was supported by a U54 grant from the NIH, as well as a 2018 [Duke CTSI Transformative Award](#). This award provided funding to address the gulf between novel clinically motivated research and products that show safety and efficacy in humans.

Early work by Sullenger’s team targeted the Von Willebrand factor (vWF), a glycoprotein crucial to stopping bleeding, with an antidote-controllable aptamer, which are molecules that can selectively bind to a specific protein. Early findings showed that targeting vWF potentially represented an effective and safer treatment for thrombosis patients with partial or complete blockage of blood flow in the brain, heart, or periphery.

With the help of the CTSI, Sullenger and his team

were able to finalize a phase I study design and clinical development plan, including conducting a clinical advisory meeting with researchers from within and beyond Duke. They were also able to submit an Investigational New Drug (IND) application with the Food and Drug Administration (FDA).

“The CTSI pilot award was instrumental to getting us over the goal line to start our clinical study,” Sullenger said. “CTSI provided us both financial support, and equally important, a project leader [Juliana Layzer] so that we could navigate all of the regulatory hurdles required to test a new therapeutics agent in humans.”

Next Steps and Future Goals

Sullenger and his team helped launch Basking Biosciences, a start-up company established to solve the biggest need in acute thrombosis and accrue funding to support the clinical translation of their research. Sullenger founded the company with the help of Richard Shea, an alumnus of the Duke University Fuqua School of Business, and Shahid Nimjee, MD, PhD, professor at The Ohio State University Wexner Medical Center and former Duke resident who worked alongside Sullenger.

Earlier this year, the team presented successful results from their phase I clinical trial. The trial indicated that their thrombolytic proves to be safe and effectively inhibits vWF in humans. In parallel, the team demonstrated in advanced animal testing that the window of opportunity for intervention can be extended from four to at least six hours. The team recently completed raising funds for phase II trials to evaluate the approach in human stroke patients.

“If this intervention is successful, we will be able to help particularly vulnerable populations as several underserved groups have higher incidences of stroke and also have a more challenging time getting to an emergency room quickly,” Sullenger said. “It’s tough to raise money for studies like this, and the CTSI support was vital for getting us through the translational valley of death.”

MURDOCK Biorepository Transformation Initiative

150,000+ samples shipped

58% reduction in cost to store samples

39% reduction by storage volume

33% reduction by aliquot count



104
Inquiries



26

Completed projects
(samples shipped)

19 → 9

Footprint from
19 freezers to nine



The MURDOCK Biorepository Transformation Initiative continues to accelerate health research and discovery.

MURDOCK Samples Accelerate Heart Failure Discovery

The ease and speed of obtaining samples and data from a groundbreaking community-based biorepository at [Duke Kannapolis](#) helped to accelerate a

recent heart failure discovery by Duke researchers.

A Duke Pathology research team led by [Salvatore Vincent Pizzo, MD, PhD](#) used biospecimens and

more than 13 years of corresponding data from 690 [MURDOCK Study](#) participants to determine that serum pro-N-cadherin is an early marker of heart failure. The discovery has the potential to identify patients who would benefit from intervention before they show signs of disease, as reported in the [Journal of the American Heart Association](#).

The [Duke Clinical and Translational Science Institute \(CTSI\)](#) is making thousands of biospecimens and associated clinical outcomes data available to all Duke researchers through the [MURDOCK Biorepository Transformation Initiative](#). Duke Kannapolis is part of the CTSI and directed by [Svati H. Shah, MD, MHS](#).

With just a few clicks, a [data exploration tool](#) developed by CTSI enables Duke investigators to easily explore the 12,526-participant longitudinal cohort based in Kannapolis and encompassing Cabarrus County. The [MURDOCK storefronts](#) summarize data and samples at a glance.

"The demographics and outcomes of the participants over time is critical, and that is what sets MURDOCK apart from other biorepositories," said Paul Ferrell, who manages Pizzo's lab and quantified the new biomarker. "We would not have been able to correlate the biomarker with any meaning if we didn't have that downstream outcome data."

Tapping into the MURDOCK Biorepository

About a year ago, preliminary research indicated the protein could be a marker for heart failure. Pizzo's team needed to expand their study and reached out to Duke Kannapolis, hoping to accelerate their research by tapping into the MURDOCK biorepository.

"Our goal was to understand the role of the biomarker effectively and rigorously without waiting a decade for a new, prospective study to accumulate years of data," Pizzo said. "MURDOCK already had thousands of samples and years of follow-up, saving us an incredible amount of time while delivering the same level of rigorous data collection. The responsiveness of Duke Kannapolis saved us even more time."

Total time from completing a [brief interest form](#) to the conclusion of the study was six months. By comparison, requesting and receiving samples from other biorepositories can take up to two years.

"MURDOCK has been the springboard," said Kristi Oristian, the postdoctoral research consultant on the team. "We asked a question about the predictive nature of how something might work in the future, but we answered it using previously collected samples and data showing how health has changed over time, thanks to MURDOCK participants who had been completing annual follow-up for years."

Next Steps

With the publication of the discovery, the research has drawn interest from collaborators and venture capitalists. The team's next steps include repeating their initial findings in a different population, with additional techniques and a clinical approach.

Ultimately, they want to bring the biomarker to market and see it used in clinics and hospitals. The test for the biomarker is easy to administer and easy to understand, reducing the reliance on specialized equipment or expertise.

"Right now, there is no established community screening for heart failure," Oristian said. "There are biomarkers that catch it at a later stage, but we are talking about detection well before people start to show symptoms."

Duke Kannapolis provided Pizzo's team with two cohorts from the MURDOCK Study. The participants all reported no heart failure when they enrolled in MURDOCK, and the two groups had very similar comorbidities and demographics. The participants who eventually suffered heart failure had the elevated biomarker. Those who never developed heart failure did not.

"It's really important for us to see that against a background of common American comorbidities like high blood pressure and obesity, the biomarker was able to add additional predictive value to identify the folks who would develop heart failure," Oristian said.

Providing More Evidence

Using such closely matched cohorts provided more evidence that the biomarker is an independent predictor of heart failure, Ferrell added.

"They have such a large amount of MURDOCK data and samples that they were able to match the cohort of people who did not develop heart failure with those

who did,” Ferrell said. “That was a lot of the difficult work that Duke Kannapolis completed and then provided to us.”

The MURDOCK Biorepository Transformation Initia-

tive makes thousands of biospecimens and associated clinical outcome data available to all Duke researchers. Investigators should complete this [brief interest form](#) as a first step.



The biorepository initiative provides Duke investigators with biospecimens annotated with longitudinal data from participant surveys, electronic health records, and population-based datasets.

MURDOCK Samples, Data Advance Alzheimer’s Research at Duke

Using samples and data from the [MURDOCK Study](#), Duke University researchers have found more evidence linking the disruption of a key metabolic pathway with the development of Alzheimer’s disease.

A team led by [Daniel Parker, MD](#), assistant professor of medicine, tapped into the groundbreaking MURDOCK community-based registry managed by [Duke Kannapolis](#). Using a MURDOCK cohort designed by the Duke (Pepper) Older Americans Independence Center, Parker and other found that dysregulated kynurenine pathway metabolism may play a role in Alzheimer’s disease and related dementias, as reported in the [Journal of Alzheimer’s Disease](#).

Their findings provide more evidence that interventions targeting the pathway may hold promise for the

prevention and treatment of memory disorders.

“As a large and well-characterized community-based cohort, MURDOCK provides an unparalleled opportunity to identify risk factors for Alzheimer’s disease and related dementias,” said Parker, who specializes in cognitive and physical function in older adults. “Insights gained from MURDOCK will allow us to develop better treatments for this devastating disease.”

Duke Kannapolis is the Clinical and Translational Science Institute (CTSI) research site on the North Carolina Research Campus and is directed by [Svati H. Shah, MD, MHS](#). Duke investigators are invited to [explore MURDOCK data](#) and the [MURDOCK Biorepository Transformation Initiative](#), a unique opportunity to obtain biospecimens for research. Requesting samples starts with [this brief interest form](#).



The science-forward biorepository initiative, announced in May 2022, has helped investigators across Duke.

Duke Diabetes Researchers Use MURDOCK Study to Find Markers for Fracture Risk

Samples and data from the [MURDOCK Study](#) helped Duke University researchers identify new indicators of fracture risk among older adults with type 2 diabetes.

Older adults with type 2 diabetes have an increased risk of broken bones, even though they have higher-than-average bone mineral density. A team led by [Richard H. Lee, MD](#), assistant professor of medicine, tapped into the community-based biorepository at [Duke Kannapolis](#) to study participants with type 2 diabetes who also experienced a bone fracture.

Lee's team used MURDOCK samples, self-reported fractures, and electronic medical records to assess the association between broken bones and metabolic profile in this at-risk population. Their research identified new markers of fracture risk and suggested potential mechanisms, as reported in [Osteoporosis International](#).

"The MURDOCK Study played a key role in our research to identify really novel risk factors. Ultimately, this will help us prevent more fractures in patients," said Lee, who specializes in metabolic bone disease and osteoporosis. "The Duke Kannapolis team is hardworking, skilled, and dynamic and was engaged in every part of the study process. I was exceptionally pleased with their management of my project and the quality of their work."

Located on the North Carolina Research Campus just north of Charlotte and directed by [Svati H. Shah, MD, MHS](#), Duke Kannapolis is a part of the Clinical and Translational Science Institute (CTSI). The [MURDOCK Biorepository Transformation Initiative](#) is a unique opportunity for Duke investigators to use biospecimens for research. Explore MURDOCK [data](#) and [request samples](#).



Simon Gregory, PhD, and Eric Brenner, MD, PhD (both standing on the left), accept the first Duke Golden Ticket award from CTSI and BioLabs North Carolina.

Duke Startup Earns Series A Financing for Groundbreaking Neonatal Treatment

The Duke startup that won the first Duke Golden Ticket award from Duke CTSI and BioLabs North Carolina went on to earn \$35 million in funding to develop the first treatment for newborns in neonatal intensive care units with white matter brain injury.

[Eric Benner, MD, PhD](#), assistant professor of pediatrics at Duke and co-founder of the neonatal care company Tellus Therapeutics, was presented the Duke Golden Ticket in 2019. In December 2022, [the startup announced the Series A financing](#) led by the Perceptive Xontogeny Venture Fund. Tellus is using the capital to continue important preclinical work and to advance TT-20, the company's lead candidate for the treatment of white matter brain injury in preterm infants, as well

as the company's pipeline programs.

One in 10 babies is born premature in the United States, and white matter injury (WMI) is the most common brain injury for survivors of preterm birth. There are no approved treatments for WMI in newborns. TT-20 is derived from a class of molecules found in breast milk and has demonstrated safety and efficacy in models of WMI as a potential breakthrough treatment to address this unmet medical need in babies born premature.

Founded in 2018, [Tellus Therapeutics](#) is translating breakthrough science spun out of Benner's Duke laboratory in collaboration with Tellus scientific co-founder [Simon Gregory, PhD](#), a Duke neurosurgery professor.

Kanecia Zimmerman, Joe McClernon Named CTSI Faculty Associate Directors

The Duke CTSI is proud to announce the appointment of [Kanecia Zimmerman, MD, PhD, MPH](#), and [Joe McClernon, PhD](#) as faculty associate directors of the CTSI. Zimmerman will serve as the associate director of Engagement and Health Translation, and McClernon will serve as the associate director of Partnerships and Integration.

Zimmerman and McClernon bring unique insights and expertise to the CTSI and will guide expanded

steering committee for the Pediatric Trials Network, a national pediatric clinical research program funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and currently helps to oversee the network. Zimmerman also serves as principal investigator for multiple research projects funded by the National Institutes of Health and the U.S. Food and Drug Administration.

In her work with clinical trials, Zimmerman has

often focused on improving participant and family engagement throughout the trial life cycle, as well as enhancing participant and workforce diversity in this space. She is also passionate about community-partnered research with children and families. During the COVID-19 pandemic, Zimmerman co-founded the ABC Science Collaborative to unite scientists and K-12 schools in service of children and families. She is committed to developing the next generation of physician-scientists.

McClernon has been an integral part of the CTSI for many years, serving as the director of the Eval-

uation and Strategic Planning core, interim co-director of the Team Science core, and the director of our Integration and Strategic Partnerships Pillar. During his tenure with CTSI, his guidance has been critical to building a culture of evaluation and continuous improvement, strengthening the institute's partnership with NCCU and other regional partners, and planning strategy and development.

McClernon is a professor in the Duke Department of Psychiatry and Behavioral Sciences and founder/director of the Center for Addiction Science and Technology (CfAST). His research is focused on improving our understanding of tobacco use, developing new



Kanecia Zimmerman, MD, PhD, MPH, and Joe McClernon, PhD, are new faculty associate directors of the CTSI.

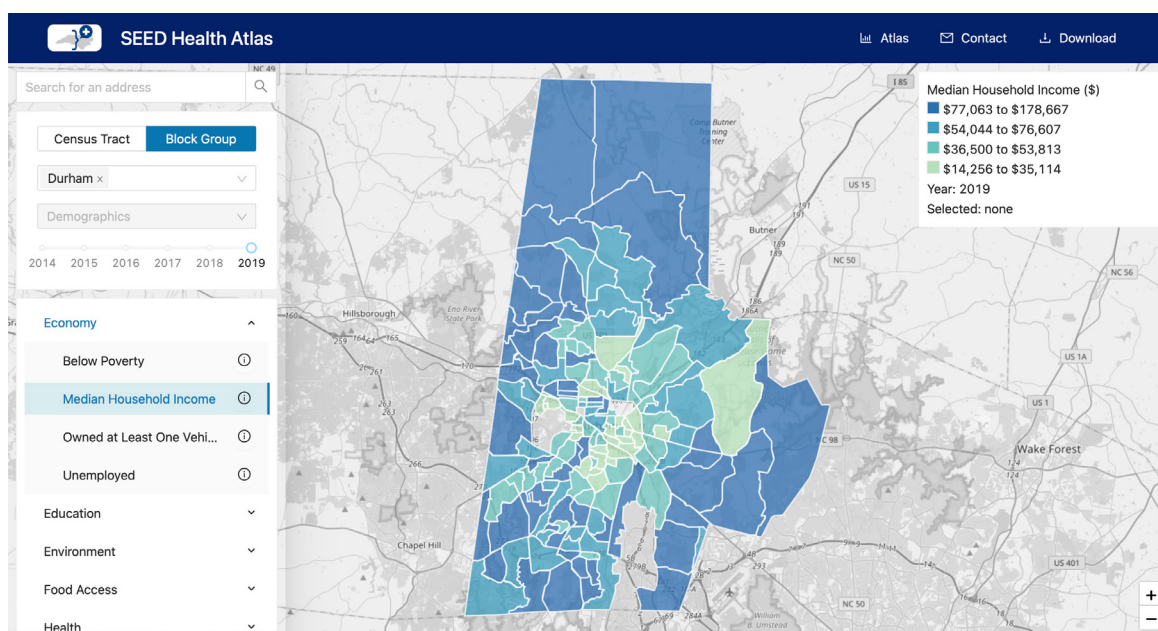
programs to broaden the impact of the CTSI across Duke University and Duke Health, as well as deepen our partnership with local and regional communities. While they will have different areas of focus, they will work closely and collaboratively to take on cross-cutting and outward-facing initiatives including rapid translation of research to clinical practice, decentralization of clinical research beyond traditional academic centers, and growth of the Duke-NCCU partnership supported by the [Duke-NCCU Bridge Office](#).

Zimmerman is a professor in the Duke Department of Pediatrics, where she specializes in pediatric critical care medicine. She recently served as chair of the

and more effective interventions for nicotine dependence, and informing the FDA's regulation of tobacco products. He has served as a site PI and co-investigator for more than 10 years in the Center for the Evaluation of Nicotine in Cigarettes (CENIC) — a national consortium that has provided extensive evidence to the FDA for informing national policies that will reduce nicotine in cigarettes to non-addictive levels. His

work has been continuously funded by the NIH, FDA, and foundations since 2002.

The expertise and experience that Zimmerman and McClernon bring to the CTSI and their leadership within our organization will support our expanding mission with a strong focus on improving health and health equity for Duke patients and our communities and advancing our important partnership with NCCU.



SEED Atlas map showing the distribution of median household income in Durham.

SEED Atlas Offers Duke Researchers Access to Social Drivers of Health Data

When it comes to a patient's health, there are more factors than just clinical characteristics that can have an impact. The conditions of the environments where people are born, live, learn, work, play, and age affect their quality of life and health. These factors, also known as social drivers of health (SDOH), are starting to be more recognized by doctors and clinical researchers, however it can be challenging to know where to get SDOH data, which variables to use, and how to link SDOH data with health data.

The [Social, Environmental, and Equity Drivers \(SEED\) of Health Atlas](#) is a publicly available platform and tool for researchers and community members to learn more about SDOH in Durham and surrounding counties, access local data, and promote research in health disparities and equity. Supported by Duke CTSI, the goal of the SEED Atlas is to enable users to learn more about upstream factors that drive health in Durham.

"Individuals often experience barriers to optimal

health through multiple interacting social needs, and understanding the impact of these requires linking different types of data to get a holistic picture of the needs a person is experiencing,” said [Nrupen Bhavsar, PhD](#), associate professor of surgery at the Duke University School of Medicine, director of the [CTSI Social Informatics Program](#), and member of the SEED Atlas leadership team. “By understanding these upstream factors, we might be able to intervene on the root causes of health disparities and inequities.”

The SEED Atlas curates SDOH data outside of what is captured in electronic health records. Data featured in the tool is collected by Duke researchers and sourced from local, state, and national records, including Durham Open Data Portal, the U.S. Census Bureau, and the Environmental Protection Agency. The website also features data on the prevalence of health conditions, summarized at the neighborhood level and sourced from the Duke University Health System and Lincoln Community Health Center.

Along with individual benefits, better understanding of and access to SDOH data can positively impact clinical research. Clinical researchers can use this data to inform the type of research conducted and explore interventions that are most suitable to patients.

“There are numerous examples of how SDOH can impact health,” Bhavsar said. “We know that exposure to elevated levels of air pollution can impair blood vessel function and increase calcification in arteries. Increased neighborhood stressors like violence can increase blood pressure. Living in food swamps – areas with businesses that sell high calorie fast food – increases risk for obesity and stroke.”

While building the atlas, Bhavsar and other members of the SEED leadership team consulted with faculty and staff from the School of Medicine; Nicholas Institute for Energy, Environment & Sustainability; Duke University School of Law; Sanford School of Public Policy; and Trinity College of Arts & Sciences. The team also worked closely with leaders from community-based organizations to better understand how they might use the tool.

“Researchers want to have easy access to curated data and the ability to link SDOH to other data sources, such as electronic health records,” Bhavsar said. “Or-

ganizations and community members want to be able to access and visualize the data, as well as use it for advocacy, communicate with policy makers, and understand the distribution of factors within their own neighborhoods.”

Since its launch, the SEED Atlas has been used in a number of research studies and quality-improvement projects at Duke. Clinical researchers have used SEED to obtain SDOH data and connect it to health data, and leaders with the Collaborative to Advance Clinical Health Equity have used the atlas to support work aimed at identifying and eliminating racial disparities in healthcare.

“Colleagues at Duke have stated that SEED can accelerate their research by helping transplant centers to understand how community level SDOH influence access to the waitlist and health maintenance for patients on the organ transplant waitlist,” Bhavsar said. “Pediatricians can identify neighborhoods with limited food access to think about community drivers of obesity and where community-academic partnerships can be most impactful. Bariatric surgeons can use that same information to think about success after obesity surgery outcomes. Other researchers may look more broadly at the combination of SDOH factors that drive chronic disease progression.”

The SEED team is continuing to work with researchers and other stakeholders to elicit feedback and continue to develop the atlas. In the coming weeks and months, the team plans to increase the number of years of SDOH data, as well as add data from all counties in North Carolina and additional years. In terms of functionality, the goal is to add an API which would allow research groups within Duke and collaborators outside of Duke to pull SDOH data directly from the website to their own platforms. There is interest in adding the ability of people to create more complex visualizations on the website so users can visualize two SDOH variables or one SDOH and one health variable at a time.

The SEED Atlas is a part of the broader Social Informatics Program within the CTSI, which is led by Bhavsar. Researchers interested in linking SDOH data to EHR or other health data, receiving consultations on their ongoing work, or seeking collaborations can [contact Bhavsar](#).

SECTION THREE

Investing in the Workforce of the Future

Investment now in the recruiting and training of a diverse research workforce will produce the next generation of highly skilled clinical and translational scientists and research team members who will bring needed change and insightful perspective to our research enterprise.

Duke READI, Community Partners Host Youth STEAM Event

A community outreach event hosted by the [Duke Research Equity and Diversity Initiative \(READI\)](#) brought together middle and high schoolers with speakers and resources from across Durham and Duke to learn about clinical research and careers in STEAM — science, technology, engineering, art, and math.

The half-day event organized by READI's Workforce Development and Community Partnership & Engagement working groups featured youth programming from the [Community Family Life and Recreation Center at Lyon Park](#), [Duke Clinical and Translational Science Institute \(CTSI\)](#), [Durham Parks & Recreation](#), and other community organizations and businesses. Students ages 11 through 14 learned about a range of STEAM topics, from the evolu-

tion and global impact of hip hop to the equitable use of artificial intelligence in health care, an introduction to clinical trials using quilting techniques, and how to build video games.

The students also enjoyed a Passport to STEAM activity. This speed networking opportunity gave participants and their parents a chance to talk with Duke and other STEAM experts about what they do and their career paths.

While students attended breakout sessions, READI Community Advisory Council (CAC) member Dr. Wanda Boone, director of [Together for Resilient Youth \(TRY\)](#), spoke with parents about Adverse Childhood Experiences (ACEs) and Resilience and how it affects communities, families, and individuals. TRY also provided resources that support families.





Students explore movement during a session at a STEAM community outreach event hosted by Duke READI.

At the end of the event, students discussed what they had learned throughout the day and shared what had surprised them about STEAM and potential careers. Each student left with a certificate of completion, a new friend or two, and some big ideas about what their future might hold.

The event initially took shape based on recommendations from the READI CAC to engage youth in clinical research and STEAM opportunities. READI staff members Leatrice Martin and Kenisha Bethea reached out to their primary collaborator, Dosali Reed-Bandele, executive director of the West End Community Foundation Inc., and together with READI Workforce Development co-directors Amanda McMillan and Steven Grambow engaged other community partners to brainstorm and develop an event that would pique the interest of younger students to explore careers in research.

"It's important to expose young students to opportunities in clinical research and STEAM," said Grambow. "Disparities and barriers make it more difficult for community members of color to pursue careers as

researchers or even participate in research that could improve health outcomes in their communities."

Sessions and facilitators included:

- "Celebrating 50 Years of Hip Hop and the Global Impact! and Artificial Intelligence (AI) in health-care: Making Technology Fair for Everyone!" by The D.O.C. (aka Rohan da Great) with 92.1 FM and Michael P. Cary, PhD, MSN, with the Duke University School of Nursing
- "Express and Release: Movement around Emotion — Lenae Release Method" by Gabrielle Rivero with Express & Release Therapeutic Dance
- "Vision Quilting: A Fabric for My Future and Introduction to Clinical Research/Trials" by Stephanie Freil, PhD, with the Duke Office of Clinical Research; Muhammad Zafar, MD, with Duke Children's Health; and Gloria Pinero with the Duke University School of Medicine



Event photos courtesy of Les Todd and James Burrell.

- “Learn to Build Video Games – Getting to know Unreal Engine: The Software Used to Make Fortnite” by Anthony Holley, with Wellness Through Inclusive Technology & Data; Steven Isaacs, Education Program Manager at Epic Games

The event could not have happened without the support of many volunteers from the READI project, the Duke Office of Clinical Research, and Duke CTSI. A huge thank you to the families who brought the

student participants to the event and then stayed to learn more about pathway programs that support student learning.

“The hope was with this event, we would whet some appetites for subsequent programs of this nature over the coming year,” McMillan said. “According to the students and their parents, we succeeded!”

Martin agreed. “We are so grateful to our community and industry partners, and we look forward to the next event.”



Duke CTSA TL1 Pre-Doctoral Scholar Dana Rubenstein.

TL1 Scholar Builds Connections, Expands Research Skills through Program

Dana Rubenstein entered the [Duke CTSA TL1 Pre-Doctoral Training Program](#) with an interest in health equity and tobacco use research. Since joining the program, Rubenstein's research interests have broadened to include tobacco and cannabis use in chronic pain patients, earning her accolades and publications in major clinical research journals.

Rubenstein began her research career during her undergraduate years at Brown University, where she focused on public health and Latin American and Caribbean studies and helped conduct tobacco research. Her thesis focused on a clinical trial on predictors of smoking reduction among African American and Latinx people who smoke e-cigarettes.

"I liked the research process and discovered that I wanted to work more in behavioral health," Rubenstein said. "I wanted to make a difference in people's health by helping them change their behavior."

Rubenstein enrolled at the Duke University School of Medicine in 2020, eager to expand her skillset as a

clinical researcher and focus more on health equity. Soon after, she was accepted as a TL1 scholar with [Joseph McClernon, PhD](#), CTSI associate director and professor of psychiatry and behavioral sciences, as her mentor.

Rubenstein and McClernon have collaborated on research focused on the association between pain and tobacco and cannabis use. Their study analyzed data from more than 32,000 adults and showed those who reported moderate to severe pain in the past week were twice as likely to use tobacco and 1.5 times more likely to use cannabis. Results from this research were recently published in [Addictive Behaviors](#).

"As I became more experienced through the TL1 program, I began to develop independence as a researcher," Rubenstein said. "Since incorporating cannabis use and pain into our research, I've been able to draw in researchers from all over the country and put together teams for projects to support those interests."

"Dana's productivity is impressive," McClernon

said. “But it goes beyond personal productivity; she’s a scholar who makes everyone around her that much better. She’s incredibly skilled at forming and energizing collaborations with investigators here at Duke but also from around the country including at Wake Forest, Brown, and the University of Minnesota.”

One of the benefits of the TL1 program is the dedicated time scholars can devote to not only research projects, but also additional skills that can positively impact clinical careers. In addition to McClernon’s mentorship, Rubenstein also credits TL1 mentors [David Edelman, MD](#), and [Steven Grambow, PhD](#), as contributing to her scientific development and improved statistical analysis skills.

As a medical student, Dana co-founded Healthcare Students with Disability and Chronic Illness (HSDCI), an affinity group for medical students and other health professional students to find community, support,

resources, and advocacy.

Building off McClernon’s work, Rubenstein has expanded her focus of this research to include older adults and people with mental health conditions and disabilities. In addition to the recent publication, Rubenstein has also received several awards during her time as a TL1 scholar, most recently the American Public Health Association Disability Section Student Award for work leading to a career in disability research and public health.

“Without the TL1 program, I wouldn’t have had the time or resources that have allowed me to be as productive as I have been,” Rubenstein said. “Having the time and space to learn, do my research, and make connections has enabled me to accomplish far more than I could have anticipated, and strengthened my resolve to pursue clinical research.”



Duke Career Day for HBCUs Earns High Marks

Plans are already underway for the next Duke Neurosciences Career Exploration Day, thanks to the success of the [inaugural event](#) in April 2023.

Twenty-three students and recent graduates from North Carolina Central University (NCCU) and other historically Black colleges and universities attended

the daylong event at the JB Duke Hotel. Attendees gave the event high marks — 87% said they were now more likely to consider a career in neuroscience, and 93% said they would recommend the event to their colleagues.

“Being able to speak with researchers helped me to understand the broadness of neuroscience and how it can be applied to engineering, technology, and, of course, medicine,” said Mella Myrick, an undergraduate research student at NCCU. “I would love to participate again.”

In addition to NCCU and Duke, students from North Carolina A&T State University, Bennett College, Winston-Salem State University, and UNC-Charlotte attended. They explored 10 different neuroscience

careers, participated in mock interviews, reviewed their resumes with Duke faculty, heard about funding options for medical or graduate school, and learned what life is really like as a medical student.

Co-sponsored by the CTSI’s [Duke-NCCU Bridge Office](#), Harmony Biosciences, and Alliance to Cure Cavernous Malformation, the free event also allowed students and recent graduates to connect with potential mentors and learn about research opportunities at Duke. Faculty and staff from the Duke Neurology, Neurobiology, and Neurosurgery departments hosted the event, with outreach support from the Duke-NCCU Bridge Office to HBCUs across the state.

The second annual Duke Neurosciences Career Exploration Day is tentatively scheduled for April 2024.



READI Works to BOOST Interest in Science Careers

In March 2023, members of the [Research Equity and Diversity Initiative \(READI\)](#) workforce development working group teamed up with [Susan Spratt, MD](#) to introduce seventh grade participants in the [BOOST Program at Duke University](#) to the topic of diabetes prevention. BOOST is a multidimensional

program serving Durham Public Schools students in fifth through eighth grades, with the intent to excite young people about STEM and inspire them to pursue careers in medicine and related fields. The program serves students whose identities are historically underrepresented in STEM—namely African American,

Latinx, and Indigenous students; girls; and young people from economically disadvantaged backgrounds.

Spratt, a Duke diabetes and metabolism specialist and an endocrinologist, provided a quick primer on the causes of diabetes, its impacts, and how we can avoid it through healthy eating. BOOST Scholars were then invited to brainstorm on what might constitute a healthy plate of food. And finally, in a nod to the use of social media for public health promotion, scholars were invited to create TikToks educating others on how to avoid diabetes by eating right. The TikToks can now be viewed on the [BOOST TikTok page](#).

READI is working to engage the community as equal partners in research. The workforce development working group views outreach activities like this BOOST event as ideal means for promoting that partnership by sparking student interest in research careers. Plans are afoot to invite another BOOST cohort to the research site at Pickett Road in the fall for a deep dive in what actually comprises a research study to inform diabetes prevention efforts and treatment.

To learn more about The BOOST Program and explore ways to get young people involved in your field, [visit the website](#).



Clockwise from top left: Sahradayi Patel (center) speaks to attendees; Sharleen Traynor, PhD, and Nadine Barrett, PhD (formerly with CTSI); Leshon Matthews; Joshua Carino

Equity Scholars Present Research Capstone Projects

Scholars from the 2023 Clinical Research Equity Scholars cohort presented their capstone projects and discussed what they learned during their time as scholars during a closing event.

Held at the Research @ Pickett Road clinic, the event included remarks from program leaders Nadine Barrett, PhD, former director of the CTSI's Center for Equity in Research, and Sharleen Traynor, PhD, MPH,

director of the Clinical Trials Research Associate Program at Durham Tech.

The Clinical Research Equity Scholars Program is a innovative and transformative partnership between Durham Technical Community College and Duke CTSI that provides Durham Tech students the opportunity to participate in skill-building training activities to integrate equity in clinical research operations and promote diverse representation in clinical research participation, gain hands-on experience working with clinical research teams, and work to address disparities in clinical research by engaging with communities that are underrepresented in clinical trials.

The 2023 scholars worked on recruitment efforts to support dermatology trials, the PREVENTABLE study about dementia in older adults, and the CARE and JUSTICE Study about kidney disease. Through working with these research teams, the scholars had the opportunity to apply and enhance the training they receive through the Durham Tech Clinical Research Program, learn more about clinical trials, and strengthen their research skills. This partnership and program is critical to bringing equity to clinical research and diversity to the clinical research workforce.

"The internship has been nothing short of a fantastic opportunity to apply my background in sociology to the clinical research field," said Joshua Carino, who worked with the PREVENTABLE study. "I've now gotten to see firsthand the triumphs and shortfalls of in-

cluding equity practices in the clinical research space. It has motivated me more than ever to push for more diversity and equity in all my future studies and ventures in clinical research and to strive to establish an industry standard for these practices."

Along with exposure to clinical research, the scholars also participated in the Engagement, Recruitment, and Retention Certificate Program and the Just Ask program. The certificate program helps participants expand competence in these practices and provides the tools and confidence necessary for staff to take steps toward being more inclusive. The Just Ask program helps to ensure that patients are aware and knowledgeable about research and clinical trial participation and that researchers are well-equipped with the necessary skills to communicate and effectively engage with diverse populations.

"The program deepened my understanding of disparities faced by underserved communities, providing transformative lessons that will last a lifetime," said Leshon Matthews, who worked with the CARE and JUSTICE Study team. "This experience has equipped me to be a more effective clinical research coordinator for the people."

To learn more about the program or how your study can advance equity, diversity, and inclusion by hosting an Equity Scholar, contact [Taryn Cavanaugh Faulk](#), senior program coordinator with the CTSI Workforce Development Core.



[New CTSI Tool Helps Researchers Find Training](#)

A multitude of educational and career development opportunities are offered across our academic ecosystem every day, making it difficult at times to find exactly what you need to advance toward your professional goals. The CTSI, in partnership with a number of offices across Duke, have joined forces to help research faculty and staff better navigate this crowded training terrain using CREDO: Curated Recommendations for Education and Development Opportunities.

Drawing from the Duke events calendar, CREDO pulls

training activities of particular interest to our research workforce and surfaces them to this website for convenient review. Below, you will find a regularly updated list of educational and development opportunities addressing a range of topics pertinent to research faculty and staff alike. These activities are sponsored by offices across campus that have been identified as key training partners in this domain and that have committed to ensuring that their activities are pushed to CREDO. Simply bookmark this page and then check back regularly to see what educational and training opportunities await.

Award from The Duke Endowment Expands CTSI's Work to Center Equity

Duke University School of Medicine has received an award of \$2.5 million to continue and extend the work of Duke Clinical and Translational Science Institute (CTSI) to center equity in clinical and translational science by expanding a workforce development program and enhancing an online community engagement tool.

The award will allow CTSI to expand the outreach of the [Clinical Research Equity Scholars Program](#), a collaboration with Durham Technical Community College.

CTSI's Workforce Development Pillar manages the initiative, and [students](#) have already [demonstrated the program's value](#).

Through the award, the program will vastly increase the number of equity scholars per year. Duke and North Carolina Central University subject matter experts will enhance the curriculum content, and program leaders will work with allied health, nursing, and clinical research training programs that have high rates of participation from students in underrepresented racial and



ethnic groups, as well as rural areas.

The Endowment's grant also will support further development of the [Social, Environmental, and Equity Drivers \(SEED\) of Health Atlas](#). A publicly available online platform and tool for researchers and community members to learn more about social drivers of health, the [SEED Health Atlas](#) provides access to local data and promotes research in health disparities and equity.

Working with community partners through health-equity learning and action networks, CTSI will use the SEED Health Atlas to identify specific health inequities prevalent in the community and co-develop new interventions to address them. With an interactive web dashboard, the atlas will allow CTSI to aggregate, summarize, and communicate deidentified electronic health record data from Duke Health and Lincoln Community Health Center across all neighborhoods in Durham County.

Substantial work remains to address health inequities that persist throughout North Carolina and nationwide, and as a part of its mission, CTSI must address the complex and layered influences on health by centering equity and community engagement across the research enterprise.

Bolstered by The Endowment's grant support, CTSI will work to increase diversity and inclusiveness throughout the entire clinical science and translation workforce. Critical areas of need are robust pathways and training opportunities to fill and support positions such as clinical research coordinators, project managers and coordinators, and outreach and engagement

roles within the research enterprise.

CTSI also will focus on developing and democratizing tools and resources to equitably engage patients, clinicians, policy makers, private sector, industry, and community members and organizations in our work. Data, tools, and resources must be easily shared, understood, and used by community stakeholders who are particularly well-positioned to intervene on health inequities.

Three CTSI centers will collaborate on this initiative: the [Center for Pathway Programs \(CPP\)](#), the [Center for Equity in Research \(CER\)](#), and the [Center for Community and Population Health Improvement \(CCPHI\)](#). Multiple cores and groups across CTSI will contribute, including the [Duke-NCCU Bridge Office](#).

Leadership for this project includes [Michelle J. Lyn, MBA, MHA](#), co-director for the CTSI Learning Health Communities Pillar; [Steve Grambow, PhD](#), co-director for the CTSI Workforce Development Pillar; and [Nrupen A. Bhavsar, PhD, FAHA](#), director for the CTSI Social Informatics Program.

About The Duke Endowment

Based in Charlotte and established in 1924 by industrialist and philanthropist James B. Duke, The Duke Endowment is a private foundation that strengthens communities in North Carolina and South Carolina by nurturing children, promoting health, educating minds, and enriching spirits. Since its founding, it has distributed \$4.5 billion in grants. The Endowment shares a name with Duke University and Duke Energy, but all are separate organizations.



Equity Scholar Joshua Carino has secured a full-time position as a clinical research professional at the University of North Carolina-Chapel Hill.

Equity Scholar Embarks on Career in Clinical Research

When Joshua Carino started in the Clinical Research Equity Scholars program in 2022, he hoped the program would serve as a stepping stone on his path toward a career in research. Now, Carino is embarking on his first full-time position as a research assistant for the Lineberger Comprehensive Cancer Center at the University of North Carolina-Chapel Hill.

The [Clinical Research Equity Scholars program](#) is an innovative and transformative partnership between Durham Technical Community College and Duke CTSI that provides Durham Tech students the opportunity to participate in skill-building training activities to integrate equity in clinical research operations and promote diverse representation in clinical research participation, gain hands-on experience working with clinical research teams, and work to address disparities in clinical research by engaging with communities that are underrepresented in clinical trials.

Carino has a background in sociology and clinical trials research and was one of four students accepted

into the second cohort of the program. During his time as a scholar, he worked on the PREVENTABLE study, which looks at whether taking a commonly used heart medication could help prevent dementia in older adults. Carino and his fellow scholars presented their final capstone projects this fall.

"The internship has been nothing short of a fantastic opportunity to apply my background in sociology to the clinical research field," Carino said after presenting his capstone. "I've now gotten to see firsthand the triumphs and shortfalls of including equity practices in the clinical research space. It has motivated me more than ever to push for more diversity and equity in all my future studies and ventures in clinical research and to strive to establish an industry standard for these practices."

As luck would have it, Carino conducted his first phone interview for the position at the Lineberger Center on the same day he presented his final capstone. He will assume his full-time duties this month.

"I'm looking forward to working with the patient

database and learning how to abstract data from Epic and work efficiently with it," Carino said. "I'm also looking forward to working with patients in clinic. The study

that I am on currently is one that I feel will help gently acclimate me to being a research professional, and hopefully prepare for more complex work in the future."

