



Northwestern University
NUCATS
Clinical and Translational Sciences Institute



**IMPACT REPORT
2023**

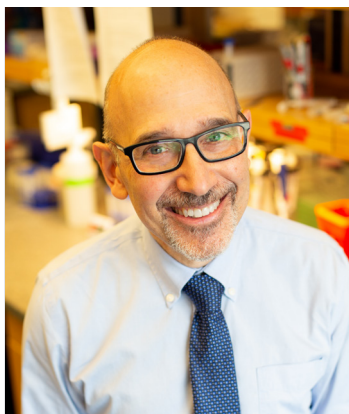
NUCATS is supported by the NIH's National Center for Advancing Translational Sciences, grant UL1TR001422, as well as Northwestern University's Feinberg School of Medicine and Office for Research

DYNAMIC ADAPTATION AND SUCCESSES PRECEDE TRANSFORMATIONAL CHANGE

In our 2022 Impact Report, I wrote that “it is ongoing adaptation that will enable us to flourish in the future.” As you will read throughout this year’s Report, NUCATS embraced change in 2023, seizing new opportunities for success. So too, did our NUCATS partners — the University’s schools, Northwestern Medicine, Lurie Children’s Hospital, and Shirley Ryan AbilityLab — as each continued to collaborate on groundbreaking discoveries. I’m so proud of all NUCATS has done in concert with these partners this year. I remain convinced that our dynamism will keep our impact growing in 2024.

As one of more than 60 NIH Clinical and Translational Science Award (CTSA)-funded hubs, the National Center for Advancing Translational Science (NCATS) is changing our mandate. The critical resources for clinical and translational research that NUCATS has built over the years must be sustained — with ongoing strong and generous institutional support from Northwestern. Now, however, CTSA hubs must do more: learn generalizable knowledge about how to best accelerate new ideas and interventions into impact that improves health for all. NCATS calls this new charge conducting “clinical and translational science,” distinguishing it from our earlier charge to provide resources for all clinical and translational research. 2023 saw a major emphasis on our planning for this transition that resulted in what I believe are transformational initiatives focused on learning how to:

- Enhance inclusive excellence for all research participants and workforce members
- Identify and evolve best practices for accelerating academic innovation
- Leverage Northwestern’s nation-leading strengths in dissemination and implementation science to ensure research results quickly lead to healthcare quality improvement and public health impact



We’ve had many accomplishments since launching in 2008, and last year helped principal investigators on many of Northwestern’s more than 6,600 clinical trials. This Impact Report details some of our accomplishments over the past year, which include:

- Making a national impact in social determinants of health research
- Providing robust support for ClinicalTrials.gov compliance
- Expanding participation in NUCATS-supported mentoring workshops
- Amplifying and supporting women academic innovators through successful collaboration in launching the FoundHer Series
- Advancing thoughtful community engagement through our Center for Community Health and Team Science Program
- Recognizing the importance of open science in collaboration with Galter Library

In 2024, we will begin enacting many plans and initiatives developed in 2023. We will continue critically evaluating them as we go, optimizing them to keep pace with our fast-moving environment. After reading this report, I hope you are energized. I welcome every idea you may have about how we can accelerate better health for all in this ever-changing world through clinical and translational science.

Richard D'Aquila
NUCATS Director

On the cover, clockwise from top left:

Alliance for Research in Chicagoland Communities (ARCC) Seed Grantee **Yaa Simpson, MPH**, community epidemiologist and bioethicist at The Association of Clinical Trial Service, greets Northwestern University faculty member **Cory Bradley, PhD, MPH**, assistant professor of Medical Social Sciences, during an ARCC Community Research Learning Exchange.

Feinberg experts, including **Mohammad Hosseini, PhD**, whose research on ethics and integrity is based at the Galter Health Sciences Library, took part in a panel discussion in March on the role of ChatGPT. Hosseini has published numerous articles on the impact and ethics surrounding AI-powered chatbots.

Khalilah Gates, MD, Assistant Dean of Medical Education, delivers her plenary talk on “Understanding Implicit Bias in Research” at the 2023 Enhancing Quality in the Translational Research Workforce (EQuaTR) Conference.

Richard McGee, PhD, Associate Dean for Faculty Recruitment & Professional Development, listens to **KL2 Scholar Chiagozie Pickens MD, MSc**, assistant professor in the Division of Pulmonary and Critical Care, as they take part in a small group discussion at the 2023 Chicagoland K Day event.

Lisa Dhar, PhD, Associate Vice President of Innovation, and director of the Center for Translational Innovation, presents at the Chicago BioCapital Summit.

Juan Espinoza, MD, was named associate director of the Center for Biomedical Informatics and Data Science and the inaugural chief research informatics officer for Stanley Manne Children’s Research Institute at the Ann and Robert H. Lurie Children’s Hospital of Chicago.

The inaugural director of the Center for Dissemination and Implementation Science, **Sara Becker, PhD**, the Alice Hamilton Professor of Psychiatry, is helping bridge the gap between public health and medical knowledge.

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Director, NUCATS Institute
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10K

NUCATS-SUPPORTED PUBLICATIONS WERE FEATURED IN MORE THAN 2,100 **NEWS ARTICLES** AND 8,000 TWEETS LAST YEAR

115K

PAGES ON THE **NUCATS WEBSITE** WERE VIEWED MORE THAN 115,00 TIMES BY NEARLY 75,000 USERS IN FY23

2,919

NUCATS STAFF AT THE **CLINICAL RESEARCH UNIT** HELPED SUPPORT MORE THAN 2,900 STUDY PARTICIPANT VISITS IN FY23

1K+

MORE THAN 1,000 PEOPLE ATTENDED THE Q FOUNDER AND FOUNDER — SUPPORTING WOMEN INVENTORS AND ENTREPRENEURS — SEMINAR SERIES ESTABLISHED BY THE QUERREY INQBATION LAB

400+

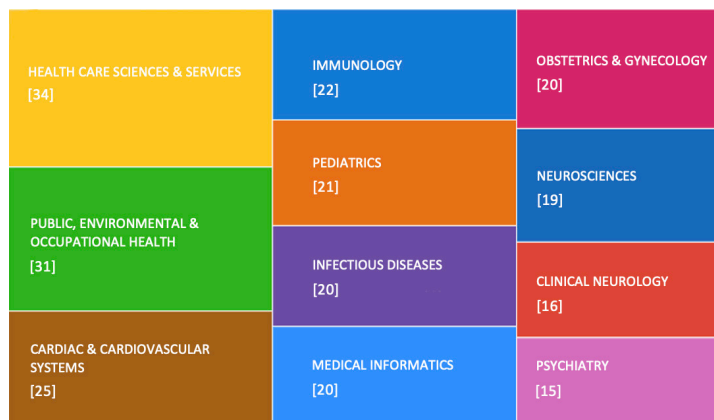
MORE THAN 400 **PUBLICATIONS** WERE SUPPORTED BY NUCATS LAST YEAR

3,500

SINCE LAUNCHING IN 2008, NUCATS HAS SUPPORTED MORE THAN 3,500 **RESEARCH PAPERS**, WHICH HAVE BEEN CITED BY ACADEMIC AND POLICY EXPERTS THROUGHOUT THE WORLD

981

SINCE 2008, TWO-DOZEN **KL2 PROGRAM** ALUMNI HAVE CONTRIBUTED TO 981 PUBLICATIONS, WITH 70 PERCENT SERVING AS PIS OR CO-PIS ON NIH-FUNDED AWARDS



HEALTHCARE SCIENCES & SERVICES WAS THE MOST-POPULAR **SUBJECT AREA** PUBLISHED BY NUCATS-SUPPORTED INVESTIGATORS IN FY23

17

IN 2023, **NUDACC** SERVED AS THE CENTRAL DATA COORDINATING CENTER FOR 17 MULTICENTER STUDIES

50,000+

TOOLS & RESOURCES ON **TEAMSCIENCE.NET** HAVE BEEN USED MORE THAN 50,000 TIMES

**RESEARCH
AT A GLANCE**

\$706M

NORTHWESTERN
UNIVERSITY FEINBERG
SCHOOL OF MEDICINE
RECEIVED MORE THAN
\$700 MILLION IN
RESEARCH FUNDING IN
FISCAL YEAR 2023

6,658

THE NUCATS
INSTITUTE HELPED TO
SUPPORT MANY OF THE
6,658 CLINICAL
RESEARCH STUDIES
THAT TOOK PLACE AT
FEINBERG IN FY23

350K

IN FY23, 349,332
INDIVIDUALS TOOK
PART IN CLINICAL
TRIAL AND RESEARCH
STUDIES AT FEINBERG,
A 44% INCREASE IN
TOTAL ACTIVE STUDY
PARTICIPANTS SINCE
2020

12

12 FEINBERG
DEPARTMENTS ARE IN
THE TOP 10 FOR NIH
FUNDING



**BIOPHARMA HUB WILL ACCELERATE
DISCOVERY TO DELIVERY TIMELINE**

A new partnership based at Northwestern Medicine's Comprehensive Transplant Center will help leading academic biomedical investigators in Chicago deliver innovative treatments and technologies to patients faster. The Chicago Biomedical Consortium Hub for Innovative Technology and Entrepreneurship in the Sciences (CBC-HITES) will help Chicago's academic inventors partner with biopharma leaders to transform their research into commercial products.

CBC-HITES is one of 13 hubs that are now part of The National Institutes of Health's Research Evaluation and Commercialization Hub (REAC Hub) program. The

new hub will be funded by a \$10.4 million investment, including \$6 million in support from the Searle Funds at The Chicago Community Trust, a \$4 million grant awarded by The National Institutes of Health, and \$400,000 by the Walder Foundation.

"The CBC has served as a Chicago-based engine of innovation for nearly 20 years," said **Rich D'Aquila, MD**, director of the NUCATS Institute. "The CBC Hub for Innovative Technology and Entrepreneurship in the Sciences adds to a robust collection of growing resources for academic innovators across every research domain at Northwestern University and beyond."

**ESPINOZA JOINS LURIE CHILDREN'S
HOSPITAL, NUCATS INSTITUTE**

As a new faculty member and leader at NUCATS, **Juan Espinoza, MD**, is bringing a fresh perspective and expertise in the oversight of research informatics and analytics as applied to basic, translational,



clinical, and population health sciences. In his roles as associate director of the Center for Biomedical Informatics and Data



JUAN ESPINOZA

Science, which spans NUCATS and the Institute for Augmented Intelligence and Medicine at Northwestern, and the inaugural chief research informatics officer for Stanley Manne Children's Research Institute at the Ann and Robert H. Lurie Children's Hospital of Chicago, he is principal investigator of an FDA-funded pediatric medical device accelerator. "We're really proud that we're able to support a variety of innovations," said Espinoza. "Our portfolio of companies, collectively over the last 5 years, raised nearly half a billion dollars, including more than 30 million dollars in federal grants."

INVESTIGATING DISPARITIES IN MACHINE LEARNING

Integrating social determinants of health into machine learning models helped mitigate bias when predicting long-term outcomes for heart failure patients, according to a Northwestern Medicine study published in *Circulation: Heart Failure*.

The study found that integrating 15 measures of social determinants of health into select machine learning models noticeably reduced disparities observed in predicting the probability of long-term hospitalization or in-hospital mortality for heart failure patients.

“We show that for minority populations, the machine learning models actually performed worse than for white individuals. We also show that for people with poor socioeconomic status, let’s say for those uninsured or for people that have Medicaid, the model also performed worse and missed



YUAN LUO
Chief AI Officer

people that are at a higher risk of dying or have a higher risk of staying in the hospital longer,” said **Yuan Luo, PhD**, associate professor of Preventive Medicine and Pediatrics, chief AI officer at the Northwestern Clinical and Translational Sciences Institute and

the Institute for Artificial Intelligence in Medicine, and senior author of the study.

PODCAST



SEGREGATION SHORTENS LIFE EXPECTANCIES

A study led by KL2 Scholar alumna **Sadiya Khan, MD, MSc**, the Magerstadt Professor of Cardiovascular Epidemiology, found that Black residents living in highly segregated neighborhoods have significantly shortened life expectancies. Published in *JAMA Health Forum*, the study found that life expectancies of people in highly segregated areas are four years shorter on average when compared to residents living in less segregated predominantly white neighborhoods. “At a broader level, we’ve learned much about the health consequences of adverse social determinants of health, but we were trying to better understand on a local level what the implications of racial segregation are on life expectancy,” said Khan.

PODCAST



1.6 MILLION EXCESS DEATHS FOR BLACK AMERICANS

From 1999 through 2020, Black Americans experienced more than 1.6 million excess deaths and more than 80 million excess years of life lost compared to white Americans, according to a study published in *JAMA*.

The findings highlight a staggering disparity in life expectancy between Black and white Americans, and drive home the need for more effective and sustainable health equity approaches in the U.S.

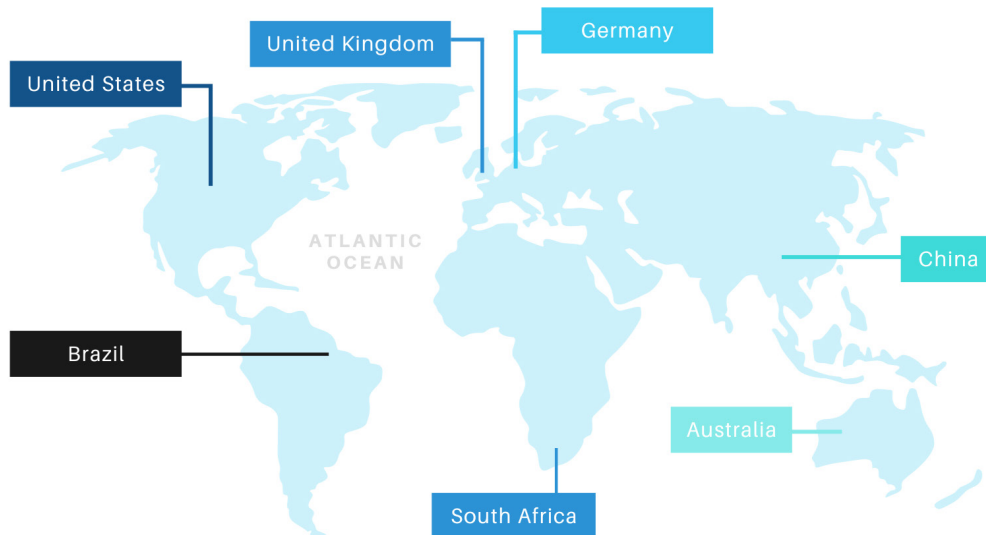
“We’ve known about disparities for decades. What we haven’t been able to appreciate before was the aggregate consequence of these disparities, otherwise known as health inequities. Now that we’ve been able to quantify, we realize the scale of these health inequities, which is not just substantial but sobering,” said **Clyde Yancy, MD, MSc**, vice dean for Diversity and Inclusion, chief and Magerstadt professor of Cardiology in the Department of Medicine, and a co-author of the study. Yancy is also associate director of diversity and inclusion at the Northwestern University Clinical and Translational Sciences Institute.

To determine trends in health disparities among Black and white Americans, investigators analyzed death certificate data from the Centers for Disease Control and Prevention from 1999 through 2020, comparing mortality rates between Black populations and white populations across all age groups.

Heart disease contributed to highest excess mortality for both Black men and women, followed by cancer in men, and these disparities also worsened at the beginning and into the COVID-19 pandemic. Excess years of potential life lost were highest among infants and middle-aged adults.

The main takeaway from these findings is the overwhelming need for a public health initiative addressing health inequity, Yancy said, and that these efforts, which include continuing to understand social determinants of health and prioritizing equitable care, cannot be limited to just policymakers and healthcare professionals, but rather be expanded to all entities that serve communities.

NUCATS MEMBERS CITED 1,198 TIMES IN 126 COUNTRIES



NUCATS Institute members continue to make a global impact. During the past year (June 22-23), NUCATS-supported research discoveries received 1,198 citations. Those citations occurred in 7 languages and in 126 nations, including the United States, United Kingdom, Germany, Australia, China, Brazil, and South Africa.

WOITOWICH NAMED NUCATS EXECUTIVE DIRECTOR

On August 1, **Nicole Woitowich, PhD**, became the NUCATS Institute's new executive director.

Woitowich previously served as center administrator for the Institute for Innovations in Developmental Sciences and Center for Reproductive Science at Northwestern University. She remains an active member of the faculty as a research assistant professor in Medical Social Sciences. Her investigative focus and passion centers on women's health and the advancement of women in science and medicine.

Woitowich is trained as a biochemist and received her PhD in biochemistry and molecular biology from Rosalind Franklin University of Medicine and Science. She has expertise in neuroendocrinology, reproductive physiology, and enzymology.

As a science communicator who served as chair of the American Society for Biochemistry and Molecular Biology Science Outreach and Communication Committee, Woitowich is frequently interviewed by members of the media on topics related to women's health and the importance of diversity, equity, and inclusion within the scientific workforce.



NICOLE WOITOWICH
Executive Director

HOLMES NAMED ASSOCIATE DEAN FOR KNOWLEDGE

Kristi Holmes, PhD, professor of Preventive Medicine, director of Northwestern's Galter Health Sciences Library, and chief of knowledge management for the Institute for Artificial Intelligence in Medicine (I.AIM), has been named the new associate dean for knowledge management and strategy at Feinberg.



KRISTI HOLMES
Associate Dean for Knowledge Management & Strategy

In her new role, Holmes will direct the development of new infrastructure and guidelines to support the sharing of knowledge within Feinberg to accelerate research and discovery.

Building upon her current work at I.AIM, NUCATS, and Galter, Holmes will guide collaboration, knowledge equity, and digital innovations to support open science at Feinberg. In addition to addressing issues of affordability and access to scholarly works to support investigators, Holmes will make further investments in data and standards as part of her work on projects such as the Open Global Data Citation Corpus and open science software and services with CERN to further support knowledge dissemination and impact. Situated within NUCATS, Galter is the only health services library embedded within a CTSA hub.



During an Alliance for Research in Chicagoland Communities (ARCC) planning meeting in Roseland, (left to right) former ARCC staff member Shehara Waas, ARCC partner Pedro Serrano, ARCC partner Melvin Thompson, ARCC Director Jen Brown, and ARCC partner Sherida Morrison pose for a selfie.

ARCC TAKES CENTER STAGE

Melvin Thompson, MBA, executive director of the Endeleo Institute, the nonprofit community development arm of Trinity United Church of Christ in Chicago, was part of a panel discussion at the Association for Clinical & Translational Science 2023 Conference on centering communities' work to transform CTSA hubs and the research enterprise. The panel also included community partners from the CTSA hubs at UIC, Utah, Michigan, and Georgetown/Howard. "Community engagement is like an art form," said Thompson, the NUCATS Institute Community Council Co-Chair & ARCC partner. "You got to keep doing it and doing it and make it part of the fabric of your work."

TEAM SCIENCE PROGRAM EVALUATING NEW TOOLKIT

A new set of tools and resources co-created by community partners and Team Science experts has launched with the intention of increasing equity, transparency, and participation in community-engaged research.



The Team Science Community Toolkit is a suite of downloadable and customizable online tools and modules for community-based organizations to use throughout the lifecycle of a potential research collaboration. Currently in the

dissemination and evaluation process, the toolkit is part of TeamScience.net.

"Participating in the development of this toolkit was an eye-opening and amazing experience," said **Ontisar Freelain**, executive director of Health Research and Awareness NFP and a member of the TeamScience.net Community Advisory Board. "Collaborating with other community-based organizations to highlight important aspects of what is needed to have an equal voice on important research initiatives proved very productive."

CAREER-BUILDING GRANTS PROPEL KL2 SCHOLARS

When **Lisanne Jenkins, PhD**, submitted her first R01 grant application, she knew the odds of being funded were against her. She also knew that the research proposed could change the way clinicians predict self-harm in early adolescence.

On average, the National Institutes of Health funds just one in five R01s. Only about the top half are even reviewed at study section.

"I really just wanted my application to qualify for that discussion," says Jenkins, research assistant professor of Psychiatry and Behavioral Sciences and a NUCATS Institute KL2 Scholar alumna. "I was shocked when I received my score, and it was very exciting to realize I would continue my path as an independent investigator."

As Jenkins begins her R01, two other KL2 alumni are embarking on renewed investigations of their own.

Anna Pfenninger, MD, PhD, assistant professor of Medicine in the Division of Cardiology, and **Kyle MacQuarrie, MD, PhD**, assistant professor of Pediatrics in the Division of Hematology, Oncology, and Stem Cell Transplantation, were recently awarded a K08 and CURE Early Investigator Award, respectively.



Katie Keeley, Mary Riorda, and NUCATS Center for Clinical Research Managing Director Katherine Hammond

RESEARCH WORKFORCE CONFERENCE DRAWS 200

The annual Enhancing Quality in the Translational Research Workforce (**EQuaTR**) Conference was held in June, marking the return to a fully in-person event. The conference welcomed 203 attendees, with most hailing from academia or hospital systems. The EQuaTR Conference offers the opportunity for clinical research staff to learn from leaders in the field, gaining practical knowledge on current trends and issues in clinical research. While hosted by the NUCATS Institute, the EQuaTR Conference is a collaborative endeavor with the Institute for Translational Medicine, and the UIC Center for Clinical and Translational Science.

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Chicago, IL 60611



REVITALIZED REGULATORY SERVICES STRENGTHEN CCR

In FY23, the Center for Clinical Research (CCR) Regulatory Services Team (pictured) was re-established to assist investigators with meeting essential regulatory activities, training, and general support to Feinberg research staff. Under the leadership of **Ashley Bowman, MHA**, the regulatory team consists of five regulatory coordinators who each oversee a variety of studies across departments within Feinberg. NUCATS regulatory study support allows for PIs and study teams to effectively screen and enroll patients across the Northwestern campus and Chicagoland area.

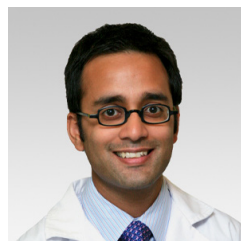
CCR continues to support investigators and study teams with three additional service lines, including Study Finance, Recruitment, and the NMH Clinical Research Unit. In FY23, CCR provided support to four schools at Northwestern and to 25 departments and divisions within the Feinberg School of Medicine.

Under the leadership of **James Kim**, the Financial Services team oversaw the intake and initiation of 50 new industry-sponsored studies in FY23. **Mary Beth Blocher** provided resources to the greater Feinberg research community on ClinicalTrials.gov compliance. This included new educational resources and enhanced, systematic reminders to study teams. Blocher and **Anju Peters, MD**, professor of Medicine, launched "Clinical Research 101," an online training designed as an introduction to the basics of clinical research.

Peters also oversees the NMH CRU where Clinical trials were increasingly common in oncology. As part of inpatient mobile-nursing services in the NMH CRU, the CRU team successfully worked in FY23 to initiate recurring leadership meetings amongst key stakeholders in oncology inpatient units, conducted focus groups on process improvement, implemented new-RN training to CRU mobile visits, and introduced a collaboration guide to establish clear communication and roles. In total, the CRU assisted with 253 studies in FY23.

SEVEN NUCATS MEMBERS AMONG MOST HIGHLY CITED

Seven NUCATS Institute members were among 12 Feinberg faculty named to the 2023 "Highly Cited Researchers" list, published by Clarivate Analytics. The annual list identifies investigators who have demonstrated significant influence in their field through the publication of highly cited publications during the last decade.



SANJIV SHAH

NUCATS investigators included in the list and recognized for their exceptional impact on their fields are: **David Cella, PhD**, professor of Medical Social Sciences; **Mark Hersam, PhD**, professor of Medicine in the Division of Pulmonary and Critical Care; **Donald Lloyd-Jones, MD, ScM**, the Eileen M. Foell Professor of Preventive Medicine; **Amy Paller, MD**, the chair and Walter J. Hamlin Professor of Dermatology; **Sanjiv Shah, MD**, the Neil J. Stone, MD, Professor of Medicine in the Division of Cardiology; **Richard Wunderink, MD**, professor of Medicine in the Division of Pulmonary and Critical Care; and **Clyde Yancy, MD, MSc**, the chief and Magerstadt Professor of Cardiology in the Department of Medicine.

SCIENCE IN TRANSLATION PODCAST MARKS SEASON 2

In season two of "Science in Translation" we explore the collaborations that make the NUCATS Institute and CTSA consortium work. Hear from NUCATS members and partners who are dedicated to accelerating

how fast we can move a transformational finding in the lab into a treatment, cure, or strategy that will improve human health. Discover how Institute members use the tools and resources available through NUCATS to Catalyze, Accelerate, and Transform translational science. Listen to "Science in Translation" wherever you get your podcasts.

