A Powerful and Inclusive Resource

NUCATS is an integrated hub supporting and accelerating all clinical and translational science activities at Northwestern University, Ann & Robert H. Lurie Children’s Hospital of Chicago, Northwestern Memorial Healthcare, the Shirley Ryan AbilityLab, and the Jesse Brown Veterans Affairs Medical Center. Its network of centers and programs allows NUCATS to provide research teams with specialized consultative resources and expertise, education and career development in translational science, core scientific services, clinical trial support, and cutting-edge informatics and data science services to handle “big data” biomedical discovery. The Institute’s value and importance was affirmed in 2015 by a major renewal grant awarded by the National Institutes of Health (NIH) in support of NUCATS and its impactful leadership. The Institute is a highly integrated academic nexus and is recognized as a national model. In the last seven years, NUCATS has served more than 3,500 investigators and clinical research professionals across Northwestern University and its clinical affiliates and regional partners, directly supporting the publication and dissemination of 1,015 scientific research manuscripts.

The significance of this NUCATS-facilitated contribution to the scientific literature is demonstrated by the fact that these manuscripts have been cited 28,114 times by authors from 137 countries and in 26 different languages. Concurrently, the Institute has not only catalyzed explosive growth in Northwestern Medicine’s capacity to enroll participants in clinical trials, it has also championed multiple regional collaborations, providing key leadership in its field both regionally and nationally.

Centers and Programs

An extremely effective structure of six cross-linked centers and four programs allows NUCATS to focus on its vital mission. This framework also strengthens the Institute’s ability to respond effectively to specific and urgent health issues. The breadth of the services that the centers and programs provide is only matched by the incredible expertise that underlies them.

Centers

- The Center for Translational Innovation represents the arm of the Institute, focused on early basic research discoveries and accelerating biomedical invention and dissemination through commercialization.
- The Center for Clinical Research offers the resources, services, and clinical facilities to successfully perform high-quality, cost-effective clinical studies.

“The driving mission of NUCATS is to speed our transformative research discoveries to patients and the community, to improve human health. To do so, we provide researchers with an extensive infrastructure, deep expertise, and a comprehensive range of programs to facilitate their success. The result is that the timeline has been cut by almost 40% for successful therapies to go from discovery to dissemination.”

Donald Lloyd-Jones, MD, ScM, Senior Associate Dean for Clinical and Translational Research at Northwestern University and Director of NUCATS.
• The **Center for Community Health** offers a range of resources and services to support the engagement of communities, clinicians, patients, and other stakeholders as key partners in the research process.

• The **Center for Data Science and Informatics** (CDSI) combines a wide range of services and support to facilitate Big Data research, analytics, and trial design. This exciting field is transforming healthcare, and CDSI is a national leader in it.

• The **Center for Education and Career Development** partners across Northwestern and our clinical partners to train the entire spectrum of the translational workforce, from our innovative junior faculty to the research coordinators performing research studies.

• The **Galter Health Sciences Library** provides dedicated support for the research, education, and patient care missions of Feinberg and the McGaw Medical Center. Galter is transforming itself from a traditional library to one that is a next-generation information and knowledge management hub.

**Programs**

• The **Biostatistics, Epidemiology, and Research Design Program** provides expertise in research design, statistical analysis, programming, and data management.

• The **Evaluation and Continuous Improvement Program** aims to continuously improve the speed, quality, and efficiency of the methods and processes of clinical and translational science through a novel, real-time, data-driven evaluation and continuous improvement process.

• The **Pilot Translational and Clinical Studies Program** supports a wide array of pilot and seed-grant funding opportunities to advance clinical and translational science.

• The **Collaboration and Team Science Program** provides the foundation for the initiation of biomedical research collaborations.

**The Impact of Data Science**

Medicine is being revolutionized as a result of the advances in scientific computing technology, together with the evolution of Big Data. This represents an enormous opportunity and Northwestern Medicine has been at the forefront of capitalizing on it.

A critical factor in our drive to provide precision medicine is the **Northwestern Medicine Enterprise Data Warehouse**, which is housed in NUCATS. It was developed to provide a single, unified database of all clinical and research data. It currently houses over 35 terabytes (a gig of gigabytes) on 8.4 million unique patients, more than 75 million outpatient encounters, more than 19 million inpatient hospitalizations, and 530 million pieces of diagnostic and laboratory data, with more than 14.5 million pieces of data added and updated every single night. This invaluable store of data creates an environment in which research and clinical quality improvement projects can synergize with clinical applications, dramatically expanding knowledge and reducing cost as a consequence.

**Translational Workforce Development**

To effectively improve quality and efficiency of clinical and translational science research, NUCATS is devoted to innovating, testing, and disseminating new education and training initiatives to effectively equip each individual involved in translational work. The Institute’s holistic approach defines the translational workforce as investigators and research staff, as well as research participants, community members, and industry stakeholders, empowering the research teams of tomorrow.

In 2015-2016 alone NUCATS provided training and/or support to over 900 faculty, fellows, and other clinical research professionals. Our education and career development initiatives empower each individual to optimize what he or she can contribute to the advancement of clinical and translational science. Over time, NUCATS has trained more than 900 clinical research professionals from Northwestern University and its clinical affiliates, as well as regional and national institutions and industry partners, on good clinical practices. In addition, more than 230 students have graduated from the Master of Science in Clinical Investigation program, and 500 faculty, representing more than three-quarters of Feinberg departments, participated in the mentor development program.

“The future of healthcare and biomedical research will look very different than it does today. For centuries, we have treated one patient at a time. It is increasingly evident that we can treat thousands of patients at one time, and far more effectively, because of informatics and data science.”

Justin Starren, MD, PhD, FACMI, Deputy Director, NUCATS and chief of the Division of Health and Biomedical Informatics
Collaboration and Solution

Facilitating collaboration is the key function of NUCATS. Consequently, a particular emphasis is placed on Team Science, which studies how research teams organize, communicate, and conduct research to achieve breakthroughs that would be unattainable through individual or additive efforts. Coinciding with those efforts are live collaborations that are cross-institutional and that engage community and stakeholders or industry partners.

Though the right people may be at the table, numerous bottlenecks occur in the process of clinical and translational research that require significant resources and service to resolve them. NUCATS employs informatics to target sites of possible improvement, enable improved processes, and monitor the efficacy of the implemented processes. This is further evidence that every program, process, and employee of NUCATS exists to further the success of medical research across Northwestern and all of NUCATS’ partner organizations.

The Future

Innovative and lifesaving medical research is not a vision at Northwestern Medicine. It is occurring every day, and more successfully than ever, due to the indispensable assistance investigators receive from NUCATS. There is an extraordinary opportunity, however, to build on the foundation of impactful work that NUCATS has put into place and to develop even more significant solutions.

Philanthropy is an invaluable catalyst for this progress by providing funds for exciting next steps that are within reach. Many current and envisioned projects need this support in order to go forward. Philanthropic partners can do for NUCATS exactly what NUCATS does for medical researchers—accelerate success. We welcome this partnership.

Northwestern Medicine

Northwestern Memorial HealthCare and Northwestern University Feinberg School of Medicine are seeking to impact the health of humankind through Northwestern Medicine. We aspire to be the destination of choice for people seeking quality healthcare; for those who provide, support, and advance that care through leading-edge treatments and breakthrough discoveries; and for people who share our passion for educating future physicians and scientists. Our commitment to transform healthcare and to be among the nation’s top academic medical centers will be accomplished through innovation and excellence.

NUCATS is accelerating transformative research discoveries to patient care through innovative programming and advanced support systems. We invite our loyal donors and interested friends to join us in advancing NUCATS at Northwestern Medicine and ensuring our success through gifts of outright support and endowment. Philanthropy provides crucial funds to propel the research of our exceptional faculty. Such generosity supports the translation of these investigations into care, as well as the training of our next generation of experts.

For more information about supporting NUCATS, please contact:

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