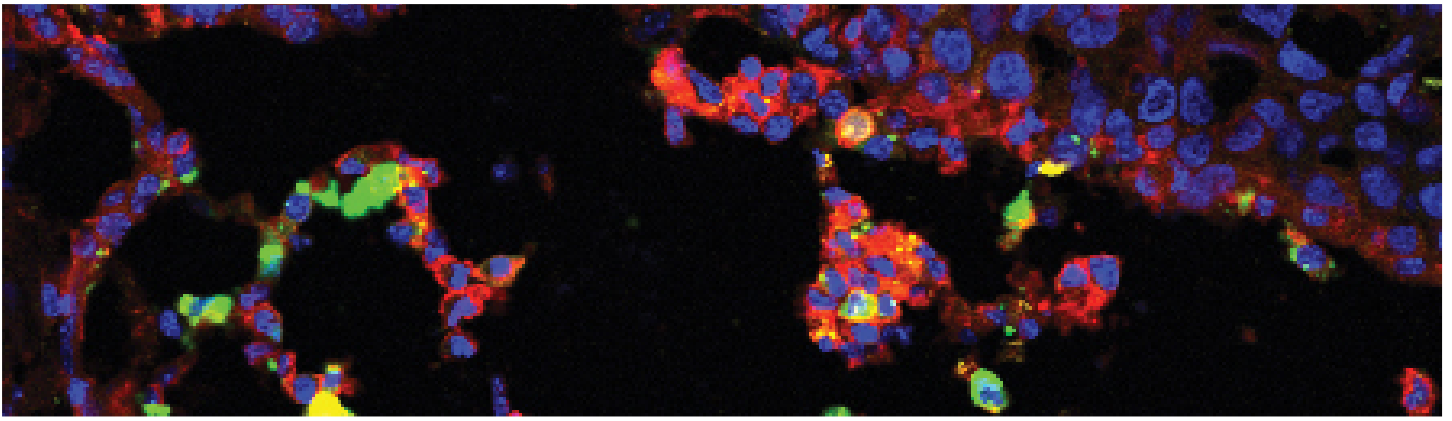


Breakthroughs

Feinberg School of Medicine Research Office

May 2023



Feinberg Research Drives Breast Cancer Screenings and Treatments Forward

By **Melissa Rohman**

At Feinberg, scientists across various disciplines are improving the efficiency of breast cancer detection through AI and machine learning, investigating disparities in patient outcomes and identifying new precision medicine strategies through robust clinical, basic science and population-health research.

“The goal is to move the needle so that fewer patients are developing recurrences if they have early-stage disease and for those with advanced disease that they’re living longer, even if you can’t cure them yet,” said [William Gradishar, MD](#), the Betsy Bramsen Professor of Breast Oncology, Chief of [Hematology and Oncology](#) in the Department of Medicine and director of the Maggie Daley Center for Women’s Cancer Care at the [Robert H. Lurie Comprehensive Cancer Center](#) of Northwestern University.

These innovative and translational research efforts are furthermore fueled by Feinberg investigators’ commitment to prioritizing patients and interdisciplinary collaboration.

“When clinical investigators, in a sense, ‘cross pollinate’ with basic laboratory investigators, both are better for it because we learn things and they certainly learn what the clinical issues are that we face,” Gradishar said.

Enhancing Breast Cancer Detection and Treatments

In recent years, integrating AI into breast cancer research has expanded and at Northwestern, the technology is being used to identify hard-to-detect cancers and patients who may be at higher risk.

“There’s a lot to be done with AI and we’re really just scratching the surface,” said [Sarah Friedewald, MD](#), vice chair for Women’s Imaging and chief of [Breast Imaging](#) in the Department of [Radiology](#).

Friedewald is the lead investigator of an ongoing [study](#) at Northwestern, in partnership with Google, that is exploring whether AI models can reduce the time to diagnosis for women whose mammograms show a higher risk of breast cancer. This could potentially encourage more same day follow-ups and reduce the risk of a delayed diagnosis.

“Finding cancer earlier means it can be smaller and easier to treat. We hope this will ultimately save lives,” Friedewald said.

AI has also allowed Feinberg investigators to identify new mechanisms driving breast cancer growth and metastasis. With the help of machine learning, a recent study led by [Huiping Liu, MD, PhD](#), professor of [Pharmacology](#) and of [Medicine](#) in the Division of [Hematology and Oncology](#), found that the protein membrane CD81 interacts with another previously identified tumor-initiating cell marker, CD44, in promoting tumor cell cluster formation and lung metastasis in triple-negative breast cancer (TNBC).

Breast Cancer *(continued from cover page)*

TNBC comprises up to 15 percent of all breast cancer cases and is highly metastatic with poor long-term survival. Moreover, Liu's [findings](#) could aid in the development of more effective and affordable personalized therapies.

"Machine learning and deep learning have transformed protein structure modeling, greatly facilitating the molecular understanding and therapeutic development for TNBC and other metastatic diseases," Liu said.

Understanding Racial Disparities and Cancer Development

Other investigators have recently uncovered links between social determinants of health and breast cancer outcomes, as well as previously unknown mechanisms driving the development of different breast cancer subtypes.

According to recent findings published in *JAMA Oncology*, individual insurance status and residential zip codes are correlated with survival among women with early hormone receptor-positive breast cancer, an invasive form of breast cancer characterized by cancer cells containing either estrogen or progesterone proteins, or both.

"This study shows that where you live and what type of health insurance you have can matter," said [Betina Yanez, PhD](#), associate professor of [Medical Social Sciences](#) and a co-author of the study.

In the study, Yanez and her collaborators analyzed data from more than 9,700 women with hormone-receptor positive breast cancer enrolled in the National Cancer Institute's [TAILORx](#) breast cancer trial. They also found striking racial disparities in patient outcomes — Black women experienced shorter spans of time free of relapse and overall survival compared to white women.

"There is a need to develop more nuanced, predictive models to better understand disparities in breast cancer," Yanez said. "Some social determinants of health are modifiable, some are not; and how we address select social determinants of health can be a health policy matter."

What can be modified are intracellular mechanisms promoting breast cancer development, as demonstrated in a recent study led by [Marcelo Bonini, PhD](#), professor of [Medicine](#) in the Division of [Hematology and Oncology](#).

Recently, Bonini's team investigated the biological function of protein superoxide dismutase-2 (SOD2), a mitochondrial antioxidant protein with known dual behaviors: it can protect against cancer development while also serving as a tumor promoting agent. The specific mechanisms underlying these dual behaviors, however, were poorly understood.

According to their findings [published](#) in *Proceedings of the National Academy of Sciences*, the cellular process of acetylation led to SOD2 localizing in the cell nucleus instead of mitochondria. The post-acetylated form of the protein, NLS-SOD2, promotes stem cell gene expression, and cells expressing NLS-SOD2 were more likely to evolve into more aggressive forms of breast cancer.

"Therefore, acetylated SOD2 may be developed into a biomarker of forms of the disease that must be treated more aggressively. It is also possible that targeting nuclear-localized SOD2 pharmacologically will provide novel therapeutics to suppress cancer stem cells that are resistant to treatment and metastatic," Bonini said.

Discovering New Therapeutic Targets and Interventions

Identifying new precision medicine treatments remains at the forefront of breast cancer research for many Feinberg investigators.

Recently, [Bin Zhang, MD, PhD](#), professor of [Medicine](#) in the Division of [Hematology and Oncology](#) and of [Microbiology-Immunology](#), discovered abnormal elevated levels of the active ectoenzyme CD73 were expressed on the surface of TNBC cells, suggesting that these elevated levels increase immunosuppressive activity within the tumor microenvironment.

The findings, [published](#) in *Science Advances*, reveal a potential therapeutic strategy in which mitigating CD73 protein levels could prevent TNBC tumor progression. Decreased levels of CD73 cells could also be used as biomarkers for identifying patients who may respond more favorably to immunotherapy.

"We think if you modulate CD73 protein levels directly, not only can you diminish the enzyme activity but also can target CD73 independent of enzyme activity function," Zhang said.

Feinberg investigators have also engineered novel [neural stem cells](#) (NSCs) that, according to a recent findings, improved survival in mice with HER2-positive breast cancer brain metastases when used in combination with the HER2 inhibitor drug, tucatinib.

"Both the NSCs and tucatinib can cross the blood-brain barrier, so there are no issues with the permeability of the brain. Here we demonstrate that the combination of both agents were able to target HER2 positive breast cancer cells in the brain and enhance survival," said Alex Cordero-Casanovas, PhD, a postdoctoral fellow in the laboratory of [Maciej Lesniak, MD](#), chair and the Michael J. Marchese Professor of [Neurosurgery](#), and lead author of the study.

Through all these studies, Feinberg investigators continue to move breast cancer research forward to improve survivorship, where there is inequity and shed light on how the disease functions.

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Feinberg Faculty Inducted into Prestigious Honorary Societies

Nine faculty members have been inducted into honorary societies this spring.

American Society for Clinical Investigation (ASCI)

[Josh Levitsky, MD, '08 MS](#), professor of [Medicine](#) in the Division of [Gastroenterology and Hepatology](#)

[Huiping Liu, MD, PhD](#), associate professor of [Pharmacology](#) and of [Medicine](#) in the Division of Hematology and Oncology

[Daniela Ladner, MD, MPH](#), the John Benjamin Murphy Professor of Surgery and vice chair of research and innovation in the Department of [Surgery](#)

Association of American Physicians (AAP)

[Stephanie Eisenbarth, MD, PhD](#), chief of [Allergy and Immunology](#) in the Department of [Medicine](#) and the Roy and Elaine Patterson Professor of Medicine

[Leonidas Platanias, MD, PhD](#), the Jesse, Sara, Andrew, Abigail, Benjamin and Elizabeth Lurie Professor of Oncology and director of the [Robert H. Lurie Comprehensive Cancer Center](#) of Northwestern University

American Academy of Arts and Sciences (AAAS)

[Susan Quaggin, MD](#), chief and Charles Horace Mayo Professor of [Nephrology and Hypertension](#) in the Department of [Medicine](#) and director of the [Feinberg Cardiovascular and Renal Research Institute](#)

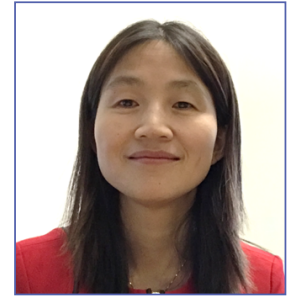
[Ali Shilatifard, PhD](#), Robert Francis Furchgott Professor and chair of [Biochemistry and Molecular Genetics](#) and director of the Simpson Querrey Institute for Epigenetics

[Shana Kelley, PhD](#), Neena B. Schwartz Professor in the Departments of [Chemistry](#), [Biomedical Engineering](#), and [Biochemistry and Molecular Genetics](#) and President of the [Chan Zuckerberg Biohub Chicago](#)

[Guillermo Ameer, ScD](#), Daniel Hale Williams Professor of Biomedical Engineering and of [Surgery](#), and director of the [Center for Advanced Regenerative Engineering](#)



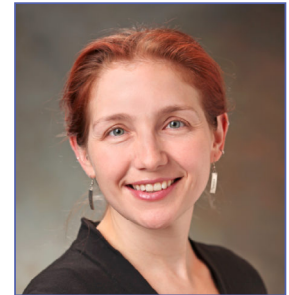
Josh Levitsky, MD



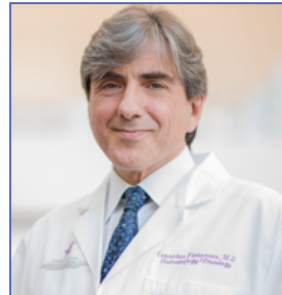
Huiping Liu, MD, PhD



Daniela Ladner, MD, MPH



Stephanie Eisenbarth, MD, PhD



Leonidas Platanias, MD, PhD



Susan Quaggin, MD



Ali Shilatifard, PhD



Shana Kelley, PhD



Guillermo Ameer, ScD

Campus Events

Institute for Sexual and Gender Minority Health and Wellbeing 2023 Pride Panel

June 15, Noon to 1:00 p.m.

ISGMH invites you to join us for this year's virtual Pride Panel. Each year, we revisit the topic, "What does pride mean to us?" highlighting different groups of voices within the LGBTQ community. We are thrilled to welcome Ramona Beltran, PhD, who will speak with a panel of indigenous SGM speakers on our topic this year.

Stonewall Conference Room
625 N. Michigan Ave., Chicago
[More information](#)

17th Annual Pain and Palliative Care Conference

June 16, 8:00 a.m. to 3:00 p.m.

The 17th Annual Pain and Palliative Care Conference will bring together physicians, nurses, social workers, chaplains and healthcare professionals to share research and clinical best practices to advance the field of palliative care and improve care for patients with serious illnesses and their loved ones.

Simpson Querrey Biomedical Research Center
Simpson Querrey Auditorium
303 E. Superior St., Chicago
[More information](#)

Neuroscience Seminar Series: Using Human Brain Imaging Studies as a Guide Towards Animal Models for Schizophrenia

June 16, Noon to 1:00 p.m.

The Kellendonk laboratory uses mouse genetic tools in an effort to understand the biology that underlies cognitive and negative

symptoms of schizophrenia. Schizophrenia is characterized by three symptom clusters: the cognitive, negative and positive symptoms. While the positive symptoms – which include disordered thought processes, hallucinations and delusions – are the most characteristic feature of the disorder, such symptoms are more difficult to model in the mouse. In contrast, cognitive and negative symptoms of the disorder – including deficits in working memory and motivation – have behavioral readouts in mice that are homologous to humans. Cognitive and negative symptoms are poorly understood, difficult to treat and their severities are a better predictor for the long-term prognosis of patients than the degree of positive symptoms.

Ward Building, 5-230
303 E. Chicago Ave., Chicago
[More information](#)

Limited Interaction Targeted Epidemiology to End the HIV Epidemic: A Third Coast CFAR EHE SWG Seminar

June 26, Noon to 1:00 p.m.

In recognition of National HIV Testing Day, the Third Coast CFAR's Ending the HIV Epidemic Scientific Working Group will host a virtual seminar featuring Chicago-based investigators leading the Limited Interaction Targeted Epidemiology (LITE) cohort studies. Speakers include Audrey French, MD, Robert Garofalo, MD, MPH, Amy Johnson, PhD, Lisa Kuhns, PhD, MPH, and Michael Newcomb, PhD, who will present on how their LITE studies utilize virtual observational methods to investigate the HIV epidemic and digital interventions along the HIV prevention and treatment continuum of care for youth and adults in the United States.

[More information](#)

Research in the News

JAMA, April 5

[It Takes an Average of 17 Years for Evidence to Change Practice – the Burgeoning Field of Implementation Science Seeks to Speed Things Up](#)

Rinad Beidas, PhD, was featured.

WTTW, April 6

[Chicago Doctor Donates Kidney to Virginia Woman She's Never Met to Inspire Others](#)

Aleksandra Gmurczyk, MD, was featured.

NBC 5 Chicago, April 12

[Northwestern Researchers Hope to End Extensive Wait Lists for Autism Diagnosis](#)

Meg Roberts, PhD, was featured.

New York Times, April 25

[22 Out of 25 Melatonin Products Were Mislabeled, Study Finds](#)

Sabra Abbott, MD, PhD, was featured.

FOX 32 Chicago, April 26

[Unique Heart Procedure Performed at Northwestern Medicine](#)

Christopher Malaisrie, MD, was featured.

Los Angeles Times, April 28

[Who Gets on a Kidney Waitlist? We're in the Dark on a Crucial Step toward Transplant](#)

Dinee C. Simpson, MD, was featured.

Identifying New Organelle Dynamics and Elucidating Their Role in Neurodegenerative Diseases



[Yvette Wong, PhD](#) is an assistant professor in the Ken and Ruth Davee Department of [Neurology's](#) Division of [Movement Disorders](#). Her [laboratory](#) uses live-cell and super-resolution microscopy to study organelle dynamics and mitochondria-lysosome contact sites in cell biology and neurodegenerative disease pathogenesis. Wong received

her PhD in Neuroscience at the University of Pennsylvania and completed her postdoctoral fellowship at Feinberg in 2020. She has received the National Institutes of Health (NIH) K99/R00 Pathway to Independence, the Warren Alpert Distinguished Scholars Award and the NIH DP2 New Innovator Award.

Read a Q&A with Wong below.

What are your research interests?

My research interests are in elucidating the molecular and cellular mechanisms underlying human diseases including neurodegenerative disorders by using live and super-resolution microscopy approaches. My research lab investigates the dynamics and regulation of inter-organelle contact sites, which are contacts that form between different organelles to allow for their bidirectional crosstalk and to regulate cellular homeostasis. We are currently studying the mechanisms and function of different contact sites, such as mitochondria-lysosome contacts which are disrupted in various neurological disorders. We are also interested in the pathways driving neurodegenerative diseases, including Alzheimer's, ALS, Parkinson's and Charcot-Marie-Tooth disease, and studying the role of different cellular processes in contributing to the pathogenesis of these disorders. Finally, we are also using super-resolution and live-cell microscopy approaches to identify new organelle dynamics and cellular pathways, to provide new insights into cellular and neuronal homeostasis, and the misregulation that occurs in human diseases.

What is the goal of your research?

The goal of our research is to identify new pathways for organelles, such as mitochondria and lysosomes, to advance the fields of neuroscience and cell biology, and to elucidate their role in neurodegenerative diseases. We hope to uncover new regulators and functions of different inter-organelle contact sites to better understand the dynamic regulation of basic cellular homeostasis. We further hope to shed light on the organelle dynamics that are misregulated in different neurological diseases as well as lysosomal storage diseases and mitochondrial disorders. In addition, we hope to identify new events occurring at the organelle level and to further explore the regulation of these pathways, and study how these dynamics are disrupted in neurodegenerative diseases and beyond. Together, these studies aim to provide new therapeutic angles for understanding the highly dynamic molecular pathways that are disrupted in human disorders.

How did you become interested in this area of research?

As a graduate student, I became fascinated by live cell microscopy, which allows us to visualize cellular events in real time. As so much of what occurs in cells and neurons happens in real time, using live imaging to investigate these cellular pathways can provide new clues into disease mechanisms. Surprisingly, there are still many cellular events which happen dynamically at the organelle level, between organelles, and within organelles, which still have not been uncovered. The field of neurodegenerative diseases is devastating as there have been limited therapeutics which can prevent disease onset or progression. Thus, understanding the cellular pathways and events driving these diseases may provide potential avenues to therapeutically target these disorders. In summary, insights into these pathways can help advance the fields of both cell biology and neuroscience, as well as have obvious implications for elucidating the mechanisms driving human diseases.

How is your research funded?

My research is currently funded by the NIH K99/R00 Pathway to Independence Award from the National Institute of Neurological Disorders and Stroke and the NIH DP2 New Innovator Award from the National Institute of General Medical Sciences.

Who inspires you?

I am very grateful for outstanding mentors who have both inspired and encouraged me during my journey in academia. These include my undergraduate research advisor Dr. Ron Harris-Warrick from Cornell University, my PhD advisor Dr. Erika Holzbaur from the University of Pennsylvania, and my postdoctoral advisor Dr. [Dimitri Krainc](#). I have greatly appreciated their advice and insights, and the highly beneficial perspectives and training I have been fortunate to receive in the respective fields of neuroscience, cell biology and neurodegenerative disease mechanisms. These have been truly valuable as I pursue studies at the intersection of these fields in my own research lab. I am also thankful for my PhD thesis committee members for their support, and for the many professors at Northwestern who do fascinating research and have also provided helpful advice along the way. Finally, I am thankful for the cell biologists, neuroscientists and microscopists around the world who have pushed the field of science forward and have provided new clues into the pathways that are misregulated in disease.

Investigating Transcriptional Regulation in Cancer Genomics



Juan Wang is a PhD student in the Driskill Graduate Program in Life Sciences. After completing her graduate studies in biomedical engineering at Tongji University Shanghai, Wang joined Northwestern and the laboratory of [Feng Yue, PhD](#), the Duane and Susan Burnham Professor of Molecular Medicine.

Currently, Wang is investigating transcriptional regulation in genes linked to cancer.

Read a Q&A with Wang below.

Where is your hometown?

I grew up in a small village from Anhui Province in China. It's a beautiful village located eastern China nearby the Yangtze River – the longest river in Asia.

What sparked your interest in science or medicine?

My interest in science has been sparked by exposure to inspiring role models. When I was in elementary school, I read a series of biographies for the great scientists in the past centuries, like Newton, Madame Curie, Franklin, Einstein etc. I was inspired by the exciting stories about how they made a difference to the world. More importantly, I have worked with very supportive and knowledgeable mentors during both my master's and PhD studies, which have played a key role in developing my interest and passion for the field. They have provided me guidance and opportunities to work on exciting research projects, which helped me cultivate a love for science.

What are your research interests?

My research interests centered on transcriptional regulation and cancer genomics. I am particularly interested in:

- Integrative analysis of large-scale genomic and epigenomic datasets to identify key factors and genomic alterations that contribute to tumorigenesis, with the ultimate goal of identifying new therapeutic targets.
- Developing new deep learning methods to learn the rule of how the genetic and epigenetic code work together in cancer and disease. By uncovering the underlying codes of transcriptional regulation, we could predict the effects of mutations and structure variation on transcription dysregulation. Overall, by leveraging multidiscipline approaches, we could potentially gain new insights about

the nature of cancer and facilitate the development of more effective treatments.

What are you currently working on?

Currently, I am working on several exciting research projects. One of the main focuses is exploring how enhancer co-amplification and hijacking promote oncogene expression in liposarcoma, a type of soft tissue sarcoma. In this project, by combining cutting-edge technologies such as Hi-C, optical mapping (Bionano), Nanopore long read sequencing, we were able to partially resolve complex structure variations and reconstruct the local genome and the giant chromosome in cancer genome. We identified enhancer co-amplification and hijacking events as novel mechanisms in oncogene dysregulation. I am also working on developing novel deep learning algorithms in analysis of cancer genomics and imaging datasets. We hope to gain a better understanding of the interaction between genetic alterations and regulatory elements and their role in disease.

Please tell us about a defining moment in your education at Feinberg thus far.

I think there are a few of them. When I first came to Feinberg, I felt myself surrounded by the supportive environment. Not only from my mentors, lab members and peers, but also from HR, IT and computation cores, etc. Another one is the publication of my first paper on pediatric high-grade gliomas when I was a third year PhD student. It was a project started and finished during the COVID-19 quarantine. The publication of the paper gave me self-confidence. Finally, receiving the Driskill Research Award was also one of the defining moments, which represented the recognition for my potential in the field of cancer genomics research. All these motivated me to continue the exploration on the road of science.

What do you hope to do with your degree?

I hope with the experiences and skills I've accumulated during my PhD, I could be an independent scientist and continue working on the questions that I am interested in.

Contributing to Scientific Discovery in the Lab for Translational Neuropsychology



Grace Minogue is a lab manager and research technologist III in the Laboratory for Translational Neuropsychology at the Mesulam Center for Cognitive Neurology and Alzheimer's Disease.

She received her bachelor's degree in neuroscience from Lawrence University before joining the Mesulam Center, where she now studies the

connection between neuropsychiatric symptoms in living patients and postmortem neurodegenerative disease markers.

Read a Q&A with Minogue below.

Where is your hometown?

I was born and raised in Chicago.

What led you to Northwestern?

After graduating with degrees in Neuroscience and Psychology, I searched for a job as a research assistant in the field. I wanted to gain lab skills, develop a better understanding of the scientific process, and contribute to scientific discovery. I found a perfect match in the Laboratory for Translational Neuropsychology and Dr. Tamar Gefen.

What are you currently working on?

Our research focuses on establishing clinicopathologic correlations between premortem neuropsychiatric symptoms and postmortem neurodegenerative disease markers. Through the use of immunohistochemistry and unbiased stereology, our goal is to answer questions on selective vulnerability and disease progression.

My latest project aimed to investigate two proteins that appear together in almost 80 percent of individuals with amnesic dementia:

- Alzheimer's disease characterized by amyloid plaques and tau-tangles
- Abnormal inclusions in brain cells known as TAR DNA-binding protein 43 (TDP-43)

The goal was to distinguish the role each disease plays in amnesic dementia. We focused our analysis on three regions of the memory-center of the brain, the hippocampus. We found important and significant differences between the amount and location of tau vs. TDP-43 in regions of the hippocampus, which helps us to distinguish and better understand these two diseases as separate entities.

How does your work support the research enterprise at Feinberg?

Our lab is part of the Mesulam Center for Cognitive Neurology and Alzheimer's Disease, which houses one of more than 30 NIH-funded Alzheimer's Disease Research Centers (ADRC) in the country. In addition to benchwork, I contribute to the Clinical Core arm of the ADRC, which manages the recruitment and retention of roughly 500 research participants. We collect cognitive testing data, biomarkers (including blood and imaging), and at death, many of these participants donate their brains. These specimens reside in the lab, and so I have the unique opportunity of working in both environments. These data are shared with other ADRCs, throughout the Northwestern community, nationally, and internationally.

Why do you enjoy working at Northwestern?

I enjoy working with my amazing lab mates and mentors - everyone is thoughtful, hard-working and passionate about the work we do. I am grateful to work alongside research staff, graduate students, post-docs, and faculty with wide-ranging expertise at the Mesulam Center as well as other departments.

New Faculty

[Lucy Godley, MD, PhD](#), joined as the inaugural director of the Jeff and Marianne Silver Family Blood Cancer Institute of the Robert H. Lurie Comprehensive Cancer Center on April 1. She will also serve as Clinical Director of Cancer Genetics. Godley received her medical degree from Northwestern University Feinberg School of Medicine, and conducted her doctoral research at University of California, San Francisco, in the laboratory of Nobel Prize laureate, Harold Varmus, MD. She has received numerous awards for her research, including the Howard Hughes Medical Institute Physician Postdoctoral Award, the Cancer and Leukemia Group B Foundation Clinical Research Award, the American Society of Clinical Oncology Young Investigator Award, and the Cancer Research Foundation Young Investigator Award. She was inducted into the American Society of Clinical Investigation in 2012.





Reach Nearly 5,000 Chicagoans Using Research Participant Portal

With support from NUCATS, Northwestern-affiliated study teams can input research studies into The New Normal Match recruitment portal. The web-based platform uses lay-friendly language and allows for users to express interest and match with research studies based on a study's inclusion and exclusion criteria. More than 50 Northwestern research teams and nearly 5,000 Chicagoans are actively using the portal. Review the TNN Match requirements, submit your study, or email the help desk for additional information. [Learn more.](#)

Tune into Northwestern Medicine Podcasts

A new webpage allows you to listen to shows from the Northwestern Medicine podcast network, where you can hear about the latest developments in medical research, healthcare, and medical education. Leaders from across specialties speak to topics ranging from basic science to translational science to public health. Science in Translation, produced by the NUCATS Institute, is among featured podcasts. Recent guests include Rod Passman, MD, Sara Becker, PhD, Satish Nadig, MD, PhD and more. [Check out the latest episodes.](#)



Improving Exercise Habits for Breast Cancer Survivors with Siobhan Phillips, PhD, MPH

There's strong evidence that physical activity can play an important role in the health and lifespan of cancer survivors. [Siobhan Phillips, PhD, MPH](#), leads the [Exercise and Health Lab](#) at Feinberg, which designs, tests, implements and disseminates physical activity interventions to support cancer survivors. In this episode, Phillips details interventions specifically designed for breast cancer survivors, a majority of whom don't meet the recommended standards for weekly physical activity.

[Listen to the episode here.](#)

NIH News

Navigating the NIH

NIH has a vested interest in receiving proposals from a wide range of investigators, from a wide range of applicant institutions. In an analysis from 2021, NIH found skewed application rates; 15 institutions submitted more than 100 applications, while 106 institutions submitted one or two applications. To assist investigators/institutions that are submitting fewer applications, NIH has developed [this resource](#) to help clarify the process, highlighting institution- and investigator-specific information, including key actions that must be taken well in advance of application submission. This resource was developed in hopes to make the process easier for those with relatively less experience submitting NIH grant applications and that it is useful for the broader research community, as well.

Update on Improving Fellowship Review: A Request for Information

NIH is recommending changes to the peer review of Ruth L. Kirschstein National Research Service Award (NRSA) fellowship applications by restructuring the review criteria and modifying brief parts of the PHS Fellowship Supplemental Form that are specific to NRSA. The goal of this effort is to facilitate the mission of NRSA fellowship peer review – to identify the most promising trainees and the excellent, individualized training programs that will help them become the outstanding scientists of the next generation.

What is a NOFO? How do NOFOs relate to FOAs and NOSIs?

A notice of funding opportunity (NOFO) is a formal announcement inviting grant award applications from extramural investigators. For years, NIH has referred to such a notice as a funding opportunity announcement (FOA); although in deference to HHS-wide practices, effective immediately, NIH is changing its nomenclature. Each of the following is a type of NOFO:

- Program announcement (PA)
- Request for applications (RFA)
- PA with set-aside funds (PAS)
- PA with special receipt, referral and/or review considerations (PAR)

A notice of special interest (NOSI) is not a type of NOFO. Instead, it is a statement of scientific priorities that encourages investigators to apply using a particular NOFO (typically a parent NOFO) on a topic of concern for the sponsoring institute.

Sponsored Research

PI: [Dustin French, PhD](#), professor of [Ophthalmology](#) and [Medical Social Sciences](#)

Sponsor: National Eye Institute

Title: **Health Disparities in Utilization, Quality, and Outcomes for Three Common Ocular Conditions (HealthDOC)**



Past studies provide strong evidence that disparities exist in healthcare, including in ophthalmology, and social determinants of health (SDH) play an important role for explaining differences in ethnic and racial receipts of healthcare. With the passage of the Affordable Care Act and later the Medicare Access and Reauthorization Act of 2015, there has been emphasis on medical quality measures with implementation the Medicare Incentive Payment System (MIPS) with the use of National Quality Forum (NQF) related metrics. The association between quality measures for ophthalmic conditions and healthcare disparities is poor. In fact, there has been little research to inform how the SDH impact care practices and quality metrics by racial/ethnic groups with cataract, glaucoma, and diabetic retinopathy.

The proposed “**Health Disparities in Utilization, Quality, and Outcomes for Three Common Ocular Conditions (HealthDOC)**” study, employed clinically, will address prevailing gaps between clinical quality measures and practice by a rigorous health services and outcomes research study design that evaluates ophthalmic NQF, and meaningful measures using the **Sight Outcomes Research Collaborative (SOURCE)** to study health disparities. SOURCE links and extracts data across healthcare systems from electronic health records to capture visual changes, clinical details (typically not available but through clinical trials) and health disparities, which is ideal for responding to Healthy People 2030 ocular goals. SOURCE overcomes major data barriers in ophthalmology health disparities work with visual outcome details for measuring treatment, quality and outcomes, joined with key information on race and ethnicity, the biological variable of gender, SDH measures, medications, hemoglobin A1c, Centers for Disease Control National Death Index Data and others.

This study will examine three major eye diseases (cataract, glaucoma, diabetic eye disease) and quantify the impact of SDH on achievement of established and peer-reviewed NQF ocular quality metrics, clinically meaningful measures on visual outcomes and non-ocular morbidity and mortality for the chronic diseases of glaucoma and diabetic retinopathy. The ocular conditions we focus on are the most common causes of irreversible visual impairment and blindness in the U.S. and fulfills the target goals for National Eye Institute and Healthy People 2030.

[Read more about the project.](#)

PI: [Elena Martinelli, PhD, MPH](#), research professor of [Cell and Developmental Biology](#)

Sponsor: National Institute of Allergy and Infectious Diseases

Title: **Turning off HIV White Noise: Switching from Long-Lived to Short-Lived Reservoir**



Tissues are major sites of HIV persistence during combined antiretroviral therapy. TGF- β is an important immune suppressor factor, which orchestrates tissue immunity. Levels of TGF- β remain elevated in HIV-infected individuals even after years of fully suppressive cART and contribute to immune suppression as well as to the development of non-AIDS-related, non-communicable disorders via pro-fibrotic mechanisms. TGF- β inhibits TCR-driven T-cell proliferation and the maturation and function of other immune cell subsets. Importantly, TGF- β is currently being used to induce HIV latency in *in vitro* models with primary T-cells. Our preliminary data demonstrate that blocking TGF- β signaling *in vivo* favors HIV latency reversal especially in tissues. Moreover, we found that TGF- β blockade stimulates SIV-specific immune responses and decreases BCL-2 expression in memory T-cells both *in vivo* and *in vitro*. These exciting new data support a view of TGF- β as a critical factor in maintaining immune cells into a resting state mostly resistant to apoptosis.

Hence, we hypothesize that blocking TGF- β will not only increase the frequency of latency reversal events, but also enhance the elimination of the viral reservoir by increasing its susceptibility to immune and viral-mediated cell death. We will investigate the mechanisms of TGF- β blockade *in vivo* in a non-human primate model of HIV infection leveraging immunoPET/CT-guided sampling with an anti-envelope probe. Tissue areas of viral reactivation following TGF- β blockade will be collected and analyzed for their transcriptomic profiles in their own tissue microenvironment. Moreover, we will dissect the mechanisms of TGF- β blockade *ex vivo* to understand the pathways dependence of the effect of TGF- β blockade on HIV latency and on the survival program of central memory T-cells. Finally, we will investigate the combination of TGF- β blockade and PD-1 blockade on the differentiation program and apoptosis sensitivity of the cells harboring the viral reservoir *in vivo*. In conclusion, we designed a comprehensive approach that will guide us to leverage this novel strategy bringing us closer to an HIV cure.

[Read more about this project.](#)

Funding

The Feinberg School of Medicine has increased seed funding up to \$50,000 for application preparation to initiate new multi-investigator program project or center grant applications involving Feinberg faculty. [Learn more on the website here.](#)

Career Catalyst Grants

[More information](#)

Sponsor: Susan G. Komen Foundation

Letter of intent: August 1

Deadline: August 5

Upper amount: \$150,000 per year for up to three years

This grant mechanism will provide critical funding to support the next generation of key leaders in the quest to end breast cancer. This opportunity supports outstanding research focused on two important aspects of precision medicine: the development of next generation targeted therapies and the development of interventions to eliminate breast cancer health disparities.

Cancer Prevention, Detection, Diagnosis and Treatment Technologies for Global Health (U01 Clinical Trial Optional)

[More information](#)

Sponsor: National Institutes of Health and National Cancer Institute

Deadline: October 14

Upper amount: \$475,000 per year, for a maximum of five years

This funding opportunity supports the development of cancer-relevant technologies suitable for use in low- and middle-income countries (LMICs). Specifically, the funding opportunity solicits applications for projects to adapt, apply and validate existing or emerging technologies into a new generation of user-friendly, low-cost technologies for preventing, detecting, diagnosing and/or treating cancers in people living with LMICs. The project must focus on a specific cancer type that is preventable or treatable in the proposed LMIC setting and must show promise to deliver medical utility for improved health outcomes.

Clinical Trial Readiness for Rare Diseases, Disorders and Syndromes (R21 Clinical Trial Not Allowed)

[More information](#)

Sponsor: National Institutes of Health, National Center for Advancing Translational Sciences and Eunice Kennedy Shriver National Institute of Child Health and Human Development

Deadline: October 17

Upper amount: \$275,000 over two years

Attaining effective therapies for rare diseases is challenging due to their low prevalence resulting in fewer patients, clinicians, researchers and resources compared to common diseases. This funding opportunity invites researchers to submit applications for support of clinical projects that address critical needs for clinical trial readiness in rare diseases. NIH supports translational and clinical research on a broad range of diseases that are defined as rare (diseases affecting less than 200,000 individuals in the United States). Despite advances in our understanding of the causes and mechanisms of many rare diseases, effective treatments are available for fewer than five percent currently.

Mechanistic Studies to Investigate the Interrelationship Between Sleep and/or Circadian Rhythms and Substance Abuse Disorders (R01 Clinical Trials Not Allowed)

[More information](#)

Sponsor: National Institutes of Health and National Institute on Drug Abuse

Deadline: November 13

Upper amount: \$300,000 per year for a maximum of five years

Substance use disorders (SUDs) and disorders of sleep/circadian rhythms are intricately interconnected. Sleep dysregulation including insufficient sleep duration, altered sleep architecture, poor sleep quality and irregular circadian rhythm is prevalent in more than 75 percent of individuals with SUDs and represents a challenge to recovery. Conversely, acute and chronic exposure to addictive substances influences sleep and circadian rhythms. The goal of this funding opportunity is to support basic and pre-clinical research project applications that explore the mechanisms that underlie the interrelationship between sleep and/or circadian rhythms and SUDs. Applicants may propose research projects using behavioral, cognitive, cellular, circuit, genetic, molecular, imaging, pharmacological and/or computational approaches.

Read more about the highlights of our educational programs, innovative research and discoveries, and our outstanding students, faculty, and staff in the [Feinberg News Center](#).



Prism: The New Feinberg Repository for Global Dissemination of Research

Feinberg has a newly available institutional repository called Prism. Prism preserves the intellectual works created by the Feinberg scholarly community and holds articles, conference presentations, preprints and other items created by faculty, staff and students. Prism helps openness, maximizes reproducibility and enhances research connections in the Feinberg community and globally to anyone with access to the internet.

“We are excited to announce the launch of Prism as the institutional repository for Feinberg School of Medicine,” said [Karen Gutzman](#), head of research assessment and communications at Galter Health Sciences Library and Learning Center. Prism replaces the former DigitalHub and includes many much-anticipated features, such as the ability to create metadata-only records for offsite datasets, set embargo dates for releasing content to the public, creating and curating communities of practice and sharing of private links to view and edit with colleagues. These new features complement existing features such as the ability to assign Digital Object Identifiers that make records citable, indexing by Google to make research widely discoverable and a responsive staff at Galter Library to answer questions and provide support.

[Kristi Holmes, PhD](#), director of Galter Health Sciences Library and Learning Center and professor of [Preventive Medicine](#), played a leading role in the development of Prism. According to Holmes, “It is essential to have a robust institutional repository that can keep up with the latest technologies and trends. As models for open access and data sharing continue to evolve, it’s clear that institutional repositories will play an increasingly critical role to make research Findable, Accessible, Interoperable and Reusable (FAIR).”

Prism builds on a strong research foundation first made possible in the DigitalHub repository. “One of the most exciting features of Prism is the ability to create communities on topics, projects or events,” said Gutzman. Communities include open access research from Feinberg on [COVID-19](#), training presentations from the [Biostatistics Collaboration Center](#) and the [NUCATS Grants Repository](#), which is a centralized resource for grant writers and investigators provided by the NUCATS Institute. “Prism is an excellent home for the NUCATS Grants Repository, allowing us to easily share exemplar grant templates and other resources with investigators across the Northwestern University community,” said [Richard D’Aquila, MD](#), director of Northwestern University Clinical and Translational Sciences Institute.

Prism is built on the InvenioRDM software, which also forms a strong and sustainable foundation for Zenodo. “With its user-friendly interface and advanced features, InvenioRDM is truly a game-changer in the world of repositories. This platform is designed to make research more accessible and open to the public, promoting innovation and collaboration within the academic community,” said Holmes. Over the past several years, European Organization for Nuclear Research (CERN) and Northwestern have collaborated as core co-developers of the software, partnering with the global Invenio Open Source Community to develop [InvenioRDM](#) as a turnkey, scalable and top-of-the-class user experience software for repositories. The InvenioRDM software offers a reliable environment for science, empowering preservation, credit, discovery and sharing while maintaining integrity in its responsiveness to the evolving needs of the research community, including data sharing policy compliance.

Notably, Northwestern and CERN recently expanded this collaboration through an award from the [Generalist Repository Ecosystem Initiative](#) (GREI) from the NIH Office of Data Science Strategy (ODSS) to Zenodo to help investigators improve discoverability of their data and lead to greater reproducibility and reuse of data.

Where can I find Prism?

Prism is available to current Feinberg faculty, staff and students at <https://prism.northwestern.edu>.

Use Prism to:

- Disseminate your work to a wider audience.
- Provide a citable link and easy access to your work.
- Store your research in a central, searchable database.
- Ensure long-term preservation of your work.

I need help and training:

Sign up for a [Prism class](#)

Search the [online Prism Guide](#)

Email questions to prism.northwestern.edu

Note: while DigitalHub will continue to be available online and viewable for a short while, new uploads are not possible after the migration to Prism. For questions about depositing datasets or for assistance with the NIH Data Management and Sharing Policy, please contact the Galter DataLab at datalab@northwestern.edu.

Prism
collect, share & preserve

High-Impact Factor Research

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Featured Core

Microsurgery and Preclinical Research Core

The [Microsurgery and Preclinical Research Core](#) of the [Comprehensive Transplant Center](#) provides high-quality microsurgical services to support all Feinberg investigators in need of small animal surgical models and blood chemistry bioanalysis, and offers consultations on any issues pertaining to microsurgical techniques in small animal models. The core develops novel animal models that may complement ongoing studies or help investigators explore novel ways to test their hypotheses *in vivo*. View the [current facility price list](#) for microsurgery procedures.

Service Areas Provided

Vascularized Transplant Surgeries – Survival Surgery

- Aortic interposition/transplantation,
- Heterotopic abdominal heart transplant or cervical heart transplant
- Spleen transplantation
- Lung transplant
- Skin transplant/parabiosis
- Liver transplant
- Vascularized composite tissue transplantation

Non-Transplant Surgical Procedures – Survival Surgery

- IRI models
- Carotid artery balloon injury
- Common BDL
- Trachea transplant
- 5/6 nephrectomy
- Minor procedures (sham surgeries, vascular cannulations)
- Islet transplant
- Unilateral ureter obstruction or reconnection

- Bile duct ligation reconstruction
- Myocardium infarction/TAC
- Intrathoracic injection/implantation
- Optic nerve injury

Non-Survival Surgical Procedures

- Multi-organ cannulation and procurement, general abdominal surgery
- Euthanasia and necropsy
- Islet Isolation, supplies and reagents are provided by the user
- Islet Isolation, supplies and reagents are provided by the core
- Cell Isolation (bone marrow, blood or solid organs and tissues)

Other Lab Procedures

- Cerebrospinal fluid (CSF) collection
- Blood tests and other chemistry tests
- Drug delivery/injection (I.P, S.C)
- Intra-venous injection/infusion
- Intracerebroventricular injection

Training

- Microsurgery Training

Instrumentation

- Surgery unit/hour

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NUCATS Podcast: Dissemination and Implementation Science with Sara Becker

In this episode, [Sara Becker, PhD](#), director of the newly formed [Center for Dissemination and Implementation Science](#) within the Institute for Public Health and Medicine at Feinberg explains steps taken in recent months to make dissemination and implementation (D&I) training more accessible to investigators and to equitably and intentionally bridge the gap between public health and medical knowledge.

[Listen to the episode here.](#)