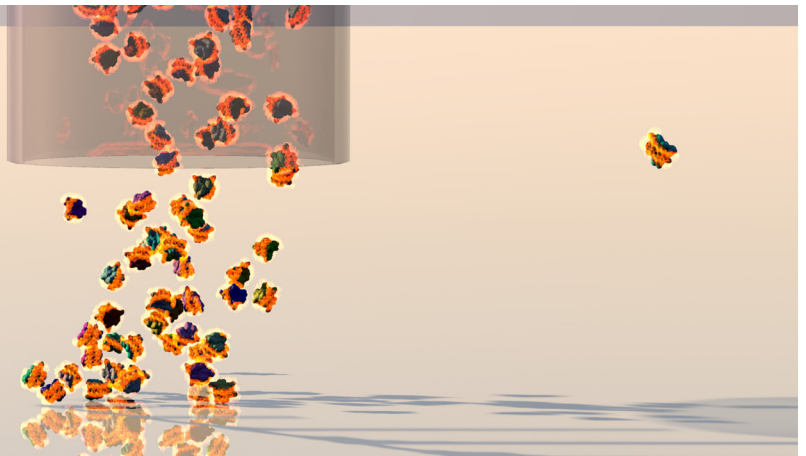


# Breakthroughs

Feinberg School of Medicine Research Office

November 2021

## Decoding the Proteome



### By Will Doss

The study of human genetics is an immensely powerful tool, revealing the contribution of inherited and spontaneous mutations to a wide array of diseases and conditions. Much of this contribution is through coding genes; genes that command construction of proteins, which participate in virtually every process in cells.

While genes are a blueprint to disease, studying the proteome — the actual protein variants present in the body — should reveal an even tighter correlation to complex disease phenotypes, according to [Neil Kelleher, PhD](#), director of [Northwestern Proteomics](#) and a professor of [Medicine](#) in the Division of [Hematology and Oncology](#).



*Neil Kelleher, PhD*

“Proteins are the molecules that build the entire body; they are the worker bees,” said Kelleher, who is also director of the [Chemistry for Life Processes Institute](#) and a professor at the Weinberg College of Arts and Sciences. “Studying the proteoform — the full-length, mature protein form in our bodies — rather than simply identifying the protein from a few pieces will help us make that higher-fidelity connection.”

### Analyzing the Proteoform

A proteoform is the specific molecular variant of a protein produced by a gene. This process is not always perfect, and

slight modifications to the protein can have a drastic impact on how it functions.

Conventional “bottom-up” proteomics analysis digests whole proteins into peptides and identifies what remains. This method is employed by the [Proteomics Core Facility](#) to provide a full spectrum of proteomics analysis and interpretation to about 100 Northwestern laboratories every year.

However, a parallel effort — housed at Northwestern Proteomics — is developing an alternative analysis method. “Bottom-up” leaves major knowledge gaps, Kelleher said, so he is leading the charge to develop what is called “[top down proteomics](#)” — a protein analysis method that relies on mass spectrometry to examine intact proteoforms with complete molecular specificity.

“The Human Genome Project started as a whisper among 20 scientists in Utah in 1988, and by 2002 they had sequenced the entire genome,” Kelleher said. “With an analogous effort to sequence the human proteome, we are approximately in the year 1992. There are technological leaps that need to be made, but this could be the decade where this happens.”

Along with this long-term plan, Kelleher and his collaborators at Feinberg are finding ways to integrate proteomics into research and clinical care, demonstrating the viability of the field and exhibiting the use cases that show its enormous potential.

### Organ Rejection Proteoforms

After a liver transplant, there’s only one way to confirm if the patient’s body is rejecting the new organ: clinicians have to sample the liver itself. The biopsy is not an inherently dangerous procedure, but a non-invasive method to monitor patients for signs of acute rejection could help physicians catch

**Proteome** (continued from cover page)

organ rejection early, giving them an opportunity to modify immune-suppression medication to prevent severe rejection and possible organ failure.

Conversely, non-invasive blood markers showing the absence of rejection could allow physicians to curtail immunosuppression more safely, reducing the side effects of those medications.

“This could help patient management and decision-making, and ultimately improve patients’ outcomes and quality of life after a liver transplant,” said [Josh Levitsky, MD, MS](#), professor of [Medicine](#) in the Division of [Gastroenterology and Hepatology](#) and of [Surgery](#) in the Division of [Organ Transplantation](#).



Josh Levitsky, MD, MS

Analyzing immune cells from archived blood samples of liver transplant recipients, Kelleher and Levitsky found several proteoforms expressed at differential levels in patients who experienced acute rejection versus those who did not. Mostly operating through inflammatory signaling pathways, these proteoforms could be the biomarkers for which transplant physicians have been looking.

The findings, [published](#) in 2017 in the *American Journal of Transplantation*, set the stage for a recently awarded [U01 grant](#) from the National Institutes of Health. Levitsky, the principal investigator of the grant, will lead a multi-center study measuring proteoform markers of rejection and using these data to inform immune suppression treatment.

“This has never been done before in liver transplant patients,” said Levitsky, who is a member of the [Comprehensive Transplant Center](#). “This is a major opportunity for our transplant center to not only lead this area of translational research but also collaborate with transplant centers across the country.”

**Proteoforms in Cardiovascular Disease**

The story of cardiovascular disease risk is often boiled down to the traditional risk factors: cholesterol, blood pressure,

insulin resistance, body weight, tobacco use, diet, physical activity and genetics. These factors have an enormous impact on risk of cardiovascular disease, heart attack and stroke, but don’t explain all of the risk, according to [John T. Wilkins, MD, MS](#), associate professor of [Medicine](#) in the Division of [Cardiology](#) and of [Preventive Medicine](#) in the Division of [Epidemiology](#).



John T. Wilkins, MD, MS

“There’s no question that these factors contribute greatly, but there are likely other factors we’re not measuring,” Wilkins said.

One such factor could be modifications to apolipoproteins, a category of proteins found in the blood that mediate cholesterol metabolism and other processes involved in cardiovascular disease risk development.

“Apolipoproteins are integral to whatever level of cholesterol you have,” Wilkins said.

Using participants from the Coronary Artery Risk Development in Young Adults (CARDIA) study, Wilkins and Kelleher measured proteoforms of apolipoprotein A1 (apoA1) in 150 participants, comparing specific ratios of proteoforms to cardiovascular risk factors such as waist circumference (a marker of abdominal body fat) and HDL cholesterol. [Publishing](#) their findings in the *Journal of the American Heart Association*, the investigators reported a positive association between HDL — good cholesterol — and several proteoform variants of apoA1.

High levels of one specific apoA1 proteoform, characterized by the addition of a fatty acid to a specific region of the protein, was associated with lower waist circumference and higher HDL. Conversely, high levels of the unmodified apoA1 proteoform had the opposite pattern of association, associated with greater waist circumference and lower HDL.

It’s unclear if these modifications are a cause or consequence of abdominal body fat or HDL level; more work is required to map the biological pathways involved. Still, these findings present opportunities to enhance the understanding of metabolic health and potentially develop better biomarkers, Wilkins said.

“It’s possible that measuring the levels of these apolipoprotein proteoforms could predict risk better than total apolipoprotein concentration alone,” Wilkins said. “This could be one way top-down proteomics could sharpen our ability to predict cardiovascular disease.”

These real-world uses of proteomics are just a taste of what is now possible, Kelleher said. Steady progress on more efficient proteome screening has already unlocked new possibilities for the field, and the future could hold even more.

“Some of the measurements we’re making now were totally out of reach when I first got to Northwestern,” Kelleher said. “We’re building the wings on the plane as it’s rolling down the runway. Someday, some year, this thing is going to take off.”

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# Les Turner ALS Symposium Celebrates Advances in Research and Patient Care

By **Melissa Rohman**

Northwestern scientists and clinicians demonstrated their continued commitment to advancing knowledge and therapies for amyotrophic lateral sclerosis (ALS) during the 11<sup>th</sup> annual Les Turner Symposium on ALS. The virtual, daylong symposium featured scientific presentations highlighting the molecular mechanisms of ALS pathogenesis, novel therapeutic approaches and a Q&A panel for individuals with ALS, their families and caretakers.

The symposium, held on November 1, was sponsored by the [Les Turner ALS Center at Northwestern Medicine](#), which brings together ALS research, clinical expertise and educational opportunities. The [Les Turner ALS Foundation](#) established the center.

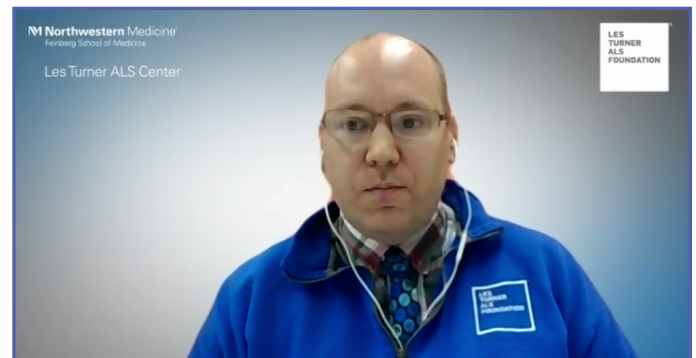
“We ensure that each person living with the disease receives the best quality care and access to promising therapies. As the longest-serving independent ALS group in the country, our approach has not changed,” said Andrea Pauls Backman, MBA, chief executive officer of the Les Turner ALS Foundation.

[Robert Kalb, MD](#), the Joan and Paul Rubschlager Professor of Neurology, chief of [Neuromuscular Disease](#) in the Ken and Ruth Davee Department of [Neurology](#) and director of the Les Turner ALS Center, gave opening remarks.

Robert H. Brown, Jr., D.Phil., MD, the Leo P. and Theresa M. LaChance Chair in Medical Research and director of the Program in Neurotherapeutics at the University of Massachusetts Medical School, delivered the keynote address. Brown emphasized a new direction for ALS therapies, including novel druggable molecular pathways supported by the discovery of more than 50 ALS-associated genes over the last three decades.

“I’m always optimistic, but I’m particularly optimistic now that some combination of the new biological therapies and the small-molecule therapies are eventually going to substantially slow this disease, and that the day will come when ALS behaves more like post-polio syndrome and becomes a chronic non-lethal disease,” Brown said.

Other scientists from Northwestern and the National Institutes of Health (NIH) discussed their recent findings and ongoing efforts investigating the molecular mechanisms of ALS pathogenesis and novel therapeutic approaches. [Colin Franz, MD, PhD ’13, ’17 GME](#), assistant professor of [Neurology](#) and of [Physical Medicine and Rehabilitation](#), underlined the clinical importance of lower motor neuron degeneration after a spinal cord injury and its implications for patient prognosis and surgical rehabilitation which can be applied to ALS research and care.



*Colin Franz, MD, PhD*

“Trauma is definitely not a genetic disease in the sense that the gene causes spinal cord injury, but these genetics can influence outcomes,” Franz said. “I think we can learn from ALS and vice versa in terms of how motor neuron health is important for both diseases.”

Michael E. Ward, MD, PhD, a principal investigator at the National Institute of Neurological Disorders and Stroke and co-director for the NIH’s iPCS Neurodegenerative Research Initiative (iNDI) shared insight on the initiative. The goal of iNDI is to improve the understanding of how genetic mutations, including expression of a cryptic exon in the gene UNC13A, can lead to the brain cell damage underlying Alzheimer’s disease and other neurodegenerative diseases.

“Targeting this cryptic exon may be a promising new therapeutic strategy for ALS, potentially improving symptoms in patients with ALS by improving synaptic function despite TDP-43 loss,” Ward said.

Another emerging area of interest is inhibiting protein aggregation in ALS gene mutations as a potential treatment strategy for neurodegenerative disorders. [Richard Silverman, PhD](#), professor of [Pharmacology](#) and the Patrick G. Ryan/Aon Professor in the Department of Chemistry at Weinberg, spoke about the development of the compound NU-9 as a potential therapeutic approach for upper motor neuron diseases.

“Since the upper motor neurons in mice and in humans are functionally and structurally really similar, it seems that if you can have a positive effect on upper motor neurons in mice, that should translate to humans,” Silverman said. “We’re hoping this can be a paradigm shift in how you look for molecules to treat upper motor neuron disease resulting from SOD1 and TDP-43 pathology.”

The final session of the symposium featured a Q&A panel, where this year’s presenters answered questions from the more than 400 attendees live-streaming the event.

# Graduate Student/Post-Doc Events and Opportunities

## Inner Works of Channelrhodopsins and Brains

Thursday, December 2

3 to 4 p.m., online via Zoom

[More information](#)

Karl Deisseroth, MD, PhD, professor of Bioengineering and of Psychiatry and Behavioral Sciences at Stanford University and Investigator of the Howard Hughes Medical Institute, will discuss the remarkable family of light-activated ion channels, or channelrhodopsins, which span three main groups.

## Anthro-Obscene What We Choose Not to See

Thursdays through December 8

10 a.m. to 10 p.m.

Norris University Center, Dittmar Gallery

1999 Campus Drive, Evanston, IL 60208

[More Information](#)

Artist Stefan Petranek presents a selection of works from “The Future is Broken,” which addresses the artist’s anxiety for the future of our planet. Seeking to create a dialogue with the viewer about the true status of our beloved places, Petranek overlays climate science data onto landscapes of personal significance.

## Drop-in Meditation

Tuesdays through December 14

1:30 to 2 p.m. CST, online

[More information](#)

Join [Elizabeth Tuckwell](#) for a 25-minute virtual guided meditation practice each Tuesday during the academic quarter. Elizabeth is the founder of a website that pairs the art of self-expression with the art of meditation. The benefits of

meditation include reducing stress, improving concentration and increasing happiness. No previous experience is necessary and all are welcome.

## Harbor: Midweek Worship and Fellowship at Sheil Catholic Center

Wednesday, December 1 and 8

8 p.m. to 9 p.m. CST Sheil Catholic Center

2110 Sheridan Road, Evanston, IL 60208

[More information](#)

Join Northwestern’s Catholic community for Harbor: Midweek Worship and Fellowship. Each week features a different type of prayer with food and fellowship afterwards. You can come as often as you like and stay as long as you are able. All are welcome.

## Harbor’s Schedule

December 1 – Adoration with Praise & Worship

December 8 – Simple Adoration with spoken Night Prayer

## Post-Docs | Virtual Culinary Class: Healthy Winter Desserts

Thursday, December 16

12:30 p.m. to 1 p.m. CST

[Register here](#)

[More information](#)

It’s time to hunker down with some comfy sweet treats that will not break your calorie bank. Join Vicki Shanta Retelny, RDN, for a 30-minute culinary session on creating warm and cozy desserts that offer nutritional benefits while at the same time soothe your sweet tooth.

## Research in the News

### ***New York Times, October 4***

[Losing Your Hair? You Might Blame the Great Stem Cell Escape.](#)

Rui Yi, PhD, was featured.

This research was also featured on [Fox 32 Chicago](#) and [U.S. News & World Report](#) and [HealthDay](#).

### ***Crain’s Chicago Business, October 6***

[Northwestern-Developed COVID Antigen Test Accurate in Under Three Minutes](#)

### ***WTTW News, October 11***

[Northwestern’s ‘Super Ager’ Research Receives \\$20 Million Grant](#)

Emily Rogalski, PhD, was featured.

### ***Fox 32 Chicago, October 19***

[Study shows how sleep can play crucial role in recovery from strokes](#)

Marc Slutzky, MD, PhD, was featured.

### ***Crain’s Chicago Business, November 3***

[Northwestern Investigates Gene Therapy for Parkinson’s Disease](#)

### ***HealthDay, November 4***

[Another Study Suggests Too Much Fish Oil Could Trigger A-Fib](#)

Linda Van Horn, PhD, was mentioned.

[More media coverage>>](#)



# Investigating the Pathologic Mechanisms of Alzheimer's Disease

Leah Cuddy, PhD, research assistant professor in the Ken and Ruth Davee Department of Neurology's Division of Behavioral Neurology



[Leah Cuddy, PhD](#), is a research assistant professor in the Ken and Ruth Davee Department of [Neurology](#) in the Division of [Behavioral Neurology](#). Her research aims to improve the understanding of how genetic variants increase Alzheimer's disease risk and lead to neurodegeneration and neuroinflammation in patients.

## Q&A

### What are your research interests?

My research focuses on understanding the molecular mechanisms underlying Alzheimer's disease pathology by studying risk-associated Alzheimer's rare variants. Specifically, I am interested in better understanding how angiotensin-converting enzyme genetic variants increase Alzheimer's risk and lead to neurodegeneration and neuroinflammation in the brains of Alzheimer's patients. The substrates and physiological functions of ACE1 are complex and the mechanism by which ACE1 mutations are involved in Alzheimer's pathogenesis is unknown. However, FDA-approved medications that target ACE1 exist for the treatment of hypertension, and my work could provide insight as to whether these drugs could potentially prevent or treat Alzheimer's disease. Additionally, I am interested in elucidating mechanisms that disrupt protein clearance pathways in neurodegenerative disease and lead to the aggregation of pathological proteins, such as amyloid-beta and alpha-synuclein. I use transgenic mouse models, cell lines and human-induced pluripotent stem-cell-derived neurons to investigate these questions.

### What is the ultimate goal of your research?

The overall goal of my research is to gain an in-depth understanding of how rare genetic mutations lead to Alzheimer's pathogenesis. This will lead to the identification of mechanisms that aid the development of novel therapeutic strategies for Alzheimer's disease. Specifically, by studying rare variants of ACE, I hope to determine the physiological function of ACE1 in the brain and how altering ACE1 function increases the risk of Alzheimer's disease.

### How did you become interested in this area of research?

I became interested in Alzheimer's disease research during my undergraduate degree at Western University in Canada. I was enrolled in an introductory course on neurodegenerative diseases that was taught by my eventual graduate advisor, and I learned about the very limited pharmacological treatment options for Alzheimer's disease. Around the same time, I was involved in volunteer service for local Alzheimer's outreach programs in the community. This allowed me to see the struggles of patients and caregivers and provided me with great insight into the translational impact of Alzheimer's research.

### What types of collaborations are you engaged in across campus (and beyond)?

I am engaged in several collaborative research projects as part of the [Vassar lab](#) at Northwestern. We work closely with Rudy Tanzi, PhD, who directs the Alzheimer's Genome Project. We also work with Dmitry Prokopenko, PhD, at Massachusetts General Hospital toward investigating ACE genetic variants in Alzheimer's disease. At Northwestern, we work regularly with [Jeff Savas, PhD](#), on proteomics-based studies. I also frequently collaborate with [Joe Mazzulli, PhD](#), and we are currently working on a project investigating the impact of farnesyltransferase inhibitors on lysosome dysfunction in Alzheimer's disease.

### Where have you recently published papers?

I have most recently published papers in [Science Translational Medicine](#) and [Neuron](#). I have also published a protocol in [STAR protocols](#) from Cell Press on the analysis of lysosomal hydrolase trafficking and activity in human-induced pluripotent stem-cell-derived neuronal models.

### Who inspires you? Who are your mentors?

I have been very fortunate to work with many inspirational and supportive mentors over the years. My graduate advisor, Jane Rylett, PhD, and my post-doc mentors, Robert Vassar, PhD and Joe Mazzulli, PhD, have played a major role in helping to shape my career and develop my skills as a scientist. In addition, I am lucky to have worked with many excellent students and colleagues here at Northwestern to whom I am able to refer for any questions, guidance or support.

# How Neurons See: Studying Retinal Ganglion Cells

Sophia Wienbar, graduate student in the Northwestern University Interdepartmental Neuroscience (NUIN) Program



Sophia Wienbar, graduate student in the Northwestern University Interdepartmental Neuroscience (NUIN) program, studies optical processing neurons in the laboratory of [Gregory Schwartz, PhD](#), the Derrick T. Vail Professor of [Ophthalmology](#) and an associate professor of [Neuroscience](#).

in epileptic or other disordered states, so I find this exciting because it's a physiological use of depolarization block for cell type specific computations.

## What attracted you to your program?

The breadth of faculty, research and students. I was confident that there would be a research group where I would find the work exciting and look forward to being in the lab every day.

## What has been your best experience at Feinberg?

One thing that I miss from the pre-pandemic times is the in-person seminar series. I really appreciated the time to gather with colleagues and friends to learn something exciting and cutting edge. Plus, the free cookies didn't hurt either.

## How would you describe the faculty at Feinberg?

A great support system! I find that my interactions with faculty are largely positive, and that they are happy to give advice or support. I feel that during my time at Feinberg, I have come to see some of the faculty as peers, which is really empowering as a graduate student.

## What do you do in your free time?

During the pandemic, I acquired a large number of plants, mostly through trading with other people. It has been a very meditative hobby and it has been rewarding to see new growth.

## What are your plans for after graduation?

I will be continuing in academia and pursue a post-doctoral position in the field of retinal physiology. I aim to continue with the trajectory of intrinsic properties and dive even further into the biophysical aspects.

## Q&A

### Where is your hometown?

I grew up in San Mateo, Calif. in the San Francisco Bay Area.

### What are your research interests?

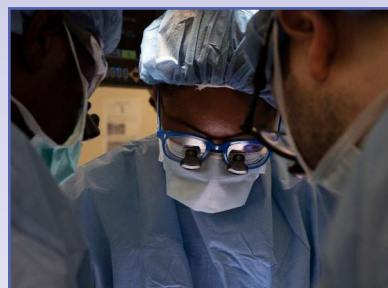
I am interested in how neurons process sensory input about the world around them, with a focus on intrinsic properties. To study this, I work in the retina where the tissue and circuits are intact and we can deliver the natural stimulus: light! I work on retinal ganglion cells, which are the spiking output cells of the retina that compute features of the mouse's visual world. I can then dissect the computations that the retinal ganglion cell uses to produce its spiking output and investigate its intrinsic properties.

### What exciting projects are you working on?

I have characterized a novel retinal ganglion cell that undergoes depolarization block in response to contrast stimuli. It is a rare type of retinal ganglion cell that is suppressed-by-contrast, which means that it decreases its firing rate for both positive and negative contrasts and it uses depolarization block to do so. We typically think that depolarization block only occurs

## Tune in to the Latest *Breakthroughs* Podcast Episodes

Listen to candid interviews with the Northwestern physicians and scientists behind the latest high-impact medical discoveries on the [Breakthroughs](#) podcast. Stay up-to-date on COVID-19 research and other scientific advances, claim continuing medical education credit and [subscribe](#) to the show, so you never miss an episode.



[The Northwestern Medicine African American Transplant Access Program with Dineen Simpson, MD](#)

[More Breakthroughs podcast episodes here.](#)

# Creating Tools to Shape Research

Matthew Baumann, developer at the Northwestern University Clinical and Translational Sciences (NUCATS) Institute



Matthew Baumann, developer at the Northwestern University Clinical and Translational Sciences (NUCATS) Institute, helps build and manage the Competitions and I2B2 tools.

## Q&A

### Where are you originally from?

I was born in Wisconsin and grew up in Green Bay.

### What is your educational background?

I have studied several disciplines. My first bachelor's degree was from St. Norbert College in biology and history. After that I pursued graduate school in classical archaeology and art history. A little later, I returned to school to do a BS/MS in computer science at Loyola University Chicago. Currently, I am using my Northwestern tuition benefits for an MA in bioethics and medical humanities.

### Please tell us about your professional background.

Odd jobs were the norm as I made my way through school, working in libraries, as an adjunct instructor or as a film extra. I also spent 10 summers working at the American School's excavations in the Athenian Agora. My job in Northwestern's Applied Informatics Group is my first programming job after school.

### Why do you enjoy working at Northwestern?

Northwestern is one of the top research institutions in the U.S. and to achieve that takes a large collective effort. I am happy to be one piece in this 6,500-piece puzzle. Without any one of us, the picture is incomplete.

### What exciting projects are you working on?

I primarily work on two projects for Northwestern. The first is [Competitions](#), an open-source tool to run NIH-style peer review of competitions, pilot projects and research proposals in a cloud-based consortium-wide single sign-on platform.

The second project is maintaining Northwestern's instance of [I2B2](#), a web-based tool that allows scientists, students and staff to develop and run simple queries against a subset of de-identified data in the Northwestern Medicine Enterprise Data Warehouse ([NMEDW](#)). This gives users the ability to quickly determine the feasibility of conducting a study.

### How do you help scientists or research students at the medical school?

Competitions helps the administration to distribute grant money to researchers. I2B2 allows researchers to find how many patient records exist for a given set of parameters, helping them decide whether to engage the EDW's services.

### What is your favorite part of the job?

Writing computer code is a combination of problem solving and building. First, we work with our customers to identify needs or opportunities for improvements in workflows. Then we architect a solution for how to meet that given set of requirements. Finally, we build out the product for the customer that solves their problem.

### What do you like to do in your spare time?

My partner and I purchased a landmarked house a few years ago and our renovation and restoration efforts keep us rather busy. I also enjoy birding when the weather and time allows.

**Did You Know?** More than 75 percent of investigators who have participated in a NUCATS Studio have had their grant funded.

### NUCATS Launches First-Submission Studios

The NUCATS Institute's First-Submission Studios for early career or new Northwestern University researchers are designed to help investigators who are in the planning stages of a first time K or R grant, or a first re-submission of an R grant.

These efficient consultations include an abbreviated review of how our centers and programs may provide support, maximize efficiency, and enhance your grant proposal. The NUCATS team can also provide a letter of support for your grant submission that highlights existing infrastructure and collaboration.

To learn more, or to schedule a 30-minute First Submission Studio, contact Senior NUCATS Research Navigator [Toddie Hays](#) (312-503-2308), or complete a [NUCATS Studio Request Form](#).



## Access All That NUCATS Can Provide in a Single (Virtual) Meeting

If you are in the planning stages of an R, U, T or P-type award with significant scope of work and infrastructure needs, you may be eligible for a [NUCATS Studio](#) session. These one-hour consultations (taking place via Zoom) bring together investigators and leadership from NUCATS and our affiliates to identify relevant resources available to support and enhance the competitiveness of grant submissions. If you'd like to request a NUCATS Studio consultation, please complete this [form](#).

# NIH News

## When in Doubt, Reach Out

Knowing when to reach out and who to contact at the NIH is important. Often, many NIH-related questions can be answered by checking out the [NIH Grants and Funding](#) website, including the [Policy and Compliance](#) and [How to Apply – Application Guide](#) pages and [FAQs](#). Even so, whether you are new to the NIH grant process or a seasoned pro, at some point you'll need help from an actual person.

Earlier this month, NIH restructured their [Need Help?](#) webpage (note the new URL – <https://grants.nih.gov/help>) based on feedback received from webpage surveys. The new page is accessible from the Help utility link in the upper right corner of the Grants and Funding website just beneath the Search bar. The page has four main sections.

- [Understand Staff Roles](#). The majority of your interactions will be with Institute/Center staff, specifically program and grants management officials. You may also interact with receipt and referral staff after application submission and scientific review officers during application review. This page explains the main responsibilities of each staff role, when to contact them and how to identify the correct staff at each stage of the process.
- [Institute and Center \(IC\) Contacts](#). Questions about a specific funding opportunity should be directed to the IC contacts in the Agency Contacts section of that opportunity. Questions about a specific application or grant award should be directed to the IC contacts listed in eRA Commons for that application/grant. If specific contacts can't be identified, use this page to find general contacts, staff directories and opportunity listings for each IC.
- [Central NIH Office Contacts](#). If you have additional policy or grants administration questions not related to a specific opportunity or award, you can reach out to NIH central

contacts. The page includes contacts for policy, compliance, human subjects, biosketch, other support, animal welfare, research training and more.

- [eRA Service Desk](#). There is now a dedicated page for eRA system support with easy access to system documentation, tutorials, FAQs and support staff.

The NIH Grants Virtual Assistant chatbot can also be an option to help identify online resources and contacts associated with your inquiry. It's still learning and improvements are constantly being made based on your interactions.

## Expanded Website Outlines How to Support Safe and Respectful Workplaces for Institutions Receiving NIH Funding

NIH recently updated their anti-sexual harassment website to encompass the range of threats to safe and respectful workplaces at institutions receiving NIH funding. The updated site outlines actions NIH can take to address different forms of harassment, how to notify them (which can be anonymous), resources to evaluate workplace climate and frequently asked questions. Read more about these updates in a [blog post](#) by NIH Deputy Director Michael Lauer, MD.

## NIH Closed for the Federal Holidays

As the holidays approach, keep in mind that NIH, including help desks, will be closed on the following dates in observance of federal holidays:

- Thursday, November 25
- Friday, December 24
- Friday December 31

If a grant application due date falls on a [federal holiday](#), the application deadline is automatically extended to the next business day.

## Welcome New Faculty

[Yan Liu, PhD](#), joins as associate professor of [Medicine](#) in the Division of [Hematology and Oncology](#). The Liu laboratory is interested in investigating the molecular mechanisms governing normal and malignant hematopoiesis with an emphasis on understanding hematopoietic stem cell (HSC) self-renewal and pathogenesis of myeloid malignancies, including myelodysplastic syndromes and acute myeloid leukemia. Along with his team, he hopes to identify novel regulators of HSC self-renewal, understand the molecular mechanisms regulating their function, and develop novel therapeutic strategies to eliminate leukemia stem cells and improve leukemia treatment. Previously associate professor of Pediatrics, Biochemistry and Molecular Biology at Indiana University School of Medicine, Liu earned his PhD at the Chinese Academy of Sciences in Beijing.





# Sponsored Research

**PIs:** [Lauren Wakschlag, PhD](#), vice chair for scientific and faculty development in the Department of [Medical Social Sciences](#), director of the Institute for Innovations in Developmental Sciences and professor of [Pediatrics](#), [Psychiatry and Behavioral Sciences](#), [Psychology and Social Policy](#); [Elizabeth Norton, PhD](#), assistant professor in the Department of [Medical Social Sciences](#) and in the Department of [Communication Sciences and Disorders](#) and director of the [Language, Education and Reading Neuroscience \(LEARN\) Lab](#)



**Sponsor:** National Institute on Drug Abuse

**Title:** 9/24 Healthy Brain and Child Development National Consortium

Neurodevelopmental processes are shaped by dynamic interactions between individual biologic and psychologic makeup and environmental experience. The environment exerts its impact even before birth via adverse prenatal exposures. These include prenatal substance use (including opioids and other substances) and ongoing exposure to stress (including chronic stress, pandemic-related stress, and discrimination stress). To elucidate how adverse prenatal exposures shape adaptive and maladaptive developmental trajectories over time, it is imperative that a normative template of developmental trajectories over the first 10 years of life be established based on a sufficiently large and demographically diverse sample of the U.S. population.

To accomplish this, the Healthy Brain and Child Development National Consortium (HBCD-NC) has been formed to deploy a harmonized, optimized, and innovative set of neuroimaging measures complemented by an extensive battery of behavioral, physiological and psychological tools as well as biospecimens to characterize neurodevelopmental trajectories in a sample of 7,500 mothers and infants enrolled at 24 sites across the United States. The HBCD-NC will carry out a common research protocol under direction of the HBCD-NC Administrative Core (HCAC) and will assemble and distribute a comprehensive and well-curated research dataset to the scientific community at large under the direction of the HBCD-NC Data Coordinating Center. Northwestern's site involves a transdisciplinary team and includes partnerships with Robert & Ann H. Lurie Children's Hospital, Alliance Chicago and John H. Stroger, Jr. Hospital. The Northwestern study team will use a community-engaged, bioethically informed, developmentally engaging approach to recruit and sustain a Chicago-based sample of 400 pregnant women and their children.

[Read more](#)

**PI:** [Alan Hauser, MD, PhD](#), vice chair of the Department of [Microbiology-Immunology](#) and professor of [Microbiology-Immunology](#) and of [Medicine](#) in the Division of [Infectious Diseases](#)



**Sponsor:** National Institute of Allergy and Infectious Diseases

**Title:** Population Analysis of *Pseudomonas aeruginosa* Virulence

*Pseudomonas aeruginosa* (PA) causes frequent and severe infections in hospitalized patients. An age-old question concerning PA is why some strains cause substantially more aggressive infections than others. The recent application of next-generation sequencing platforms to this problem has begun to provide an explanation by demonstrating that PA genomes differ substantially from strain to strain. Approximately 10-15 percent of the genes in a typical PA strain are "accessory," meaning that they are present in some strains but not others. Likewise, the "core" or conserved genome contains numerous single nucleotide variants (SNVs) and small insertion-deletions (indels). Although a few of these accessory genes and core alleles have been characterized and shown to modulate virulence, they represent the tip of the iceberg.

A systematic examination of strain-to-strain differences in PA is likely to uncover a wealth of novel virulence-impacting genes and alleles. Identification of these would have important consequences: They would enhance our understanding of PA virulence and the mechanisms by which this bacterium causes severe disease; and they would allow one to predict the virulence of PA strains based on the complement of accessory and core virulence genes/alleles that were present in their genomes.

The hypothesis is that application of comparative genomic approaches to large numbers of PA isolates will identify novel virulence genes/alleles and allow the generation of machine learning models to predict the virulence of PA isolates based on their genomes. The team will perform the following specific aims to test these hypotheses: (1) Use machine learning models to predict the virulence of PA isolates based upon their genomic content. (2) Identify accessory genes and core genome SNVs/indels that play a causal role in virulence. (3) Develop a genome-based model that predicts clinical outcomes in patients with PA bloodstream infections.

[Read more](#)

# Funding

## Damon Runyon Clinical Investigator Award Application Guidelines

[More information](#)

**Sponsor:** Damon Runyon Cancer Research Foundation  
**Application Deadline:** February 1, 2022  
**Amount:** \$600K

**Synopsis:** The Damon Runyon Clinical Investigator Award supports independent young physician-scientists conducting disease-oriented research that demonstrates a high level of innovation and creativity. The goal is to support the best young physician-scientists doing work aimed at improving the practice of cancer medicine.

## Pilot and Feasibility Studies to Improve Technology Adoption and Reduce Health Disparities in Type 1 Diabetes Mellitus (R01 Clinical Trial Required)

[More information](#)

**Sponsor:** National Institute of Diabetes and Digestive and  
Kidney Diseases (NIDDK)  
**Letter of Intent Due:** February 3, 2022  
**Application Deadline:** March 3, 2022

**Award Information:** NIDDK intends to commit \$1.75M in fiscal year (FY) 2022 to fund 4-5 awards. Application budgets are limited to \$200K in direct costs for the first year, and then \$300K for each consecutive grant year, up to four years.

**Synopsis:** The funding intends to support pilot and feasibility trials of interventions designed to improve technology adoption in individuals from underrepresented backgrounds with type 1 diabetes mellitus (T1D). Through

successful execution, these pilot and feasibility trials should provide feasibility data for larger, pragmatic trials with the overarching goal of reducing health disparity in T1D through improving technology usage in individuals from minority racial and ethnic backgrounds.

## Pediatric Obesity Discovery Science Research to Improve Understanding of Risk and Causal Mechanisms for Obesity in Early Life (R01 Clinical Trial Optional)

[More information](#)

**Sponsors:** National Institute of Diabetes and Digestive and  
Kidney Diseases  
**Letter of Intent Due:** February 8, 2022  
**Application Deadline:** March 8, 2022

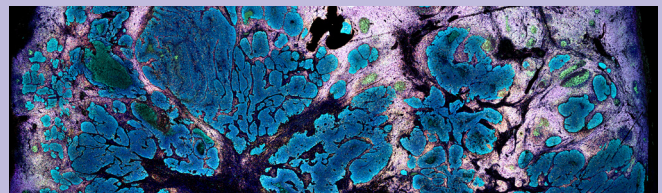
**Award Information:** NIDDK intends to commit \$1.4M in FY 2023 to fund up to two awards. Application budgets are limited to \$500K in direct costs per year for a maximum project period up to five years.

**Synopsis:** The funding intends to support innovative, discovery research studies to better characterize early-life risk factors and elucidate underlying causal mechanisms through which these risk factors contribute to the development of obesity during infancy and early childhood. Studies should aim to understand biological mechanisms that mediate behavioral and/or metabolic risk for obesity development in young children and how risk may be modified by other contributors such as psychosocial, contextual and/or environmental factors. Multidisciplinary teams of scientists including, but not limited to, individuals with expertise in basic, translational, clinical and behavioral research are encouraged to apply.

## Improving Immune Response Against Viral Infections and Disease

Blocking the PD-1 inhibitory pathway within a subset of specialized T cells may improve overall immune response against virally driven cancers, according to findings [published](#) in *Nature*.

[Rebecca Obeng, MD, PhD, MPH](#), assistant professor of [Pathology](#) in the Division of [Gastrointestinal and Hepatobiliary Pathology](#) and a member of the [Robert H. Lurie Comprehensive Cancer Center](#) of Northwestern University, was a co-author of the study.



T cells, which contain receptors that allow them to recognize and attack foreign substances, differentiate into various cell subtypes, which help shape and control the immune response. One of those subtypes are cytotoxic CD8 T cells, which directly kill virus-infected and cancerous cells. Proper activation and function of these cells is also critical for effective immunotherapy treatment for cancer patients.

# New at Galter Library: The National Evaluation Center



By Sara Gonzales, MS, MLIS, Data Librarian

In spring 2021, through a five-year cooperative agreement awarded by the National Library of Medicine at the NIH, Galter Library established the Network of the National Library of Medicine (NNLM) National Evaluation Center (NEC). The NEC provides evidence-based evaluation frameworks, tools and best practices to support evaluation and continuous improvement of NNLM programs and services, including PubMed and drug terminologies, data curation and visualization, and continuing education specializations. The nationally distributed NNLM program also makes subawards to member organizations across the country, who in turn create programs and services that will benefit from the NEC's expertise in evaluation. The NEC carries out its mission through the work of four cores:

**Administration Core** (includes Matthew Carson, PhD, head of digital systems at Galter Library; Sara Gonzales, MS, MLIS, data librarian; Roger Anderson, director of marketing and communications at NUCATS; and Galter Library developers Austin Sharp and Eric Newman):

- Management of network-wide evaluation data
- Establishment of communication, process and engagement infrastructure
- Persona profiles to represent key NNLM audiences and stakeholders

**Evaluation and Continuous Improvement Core** (includes Keith Herzog, NUCATS Administrative Director and Director; Trial Innovation Network Liaison Team; Emily Traw, assistant director of Center for Education and Career Development at NUCATS; and Pearl Go, research data analyst):

- REDCap data capture
- Monthly Evaluation Working Group meetings for evaluation champions across the network
- Tableau dashboards to visualize evaluation outcomes and inform strategic decision-making
- Quantitative and qualitative data analysis and reporting

**Community and Capacity Building Core** (includes Gregory Phillips II, PhD, assistant professor of Medical Social Sciences and Preventive Medicine (Epidemiology); Leah Neubauer, EdD, MA, associate professor of Preventive Medicine (Public Health Practice); Amy Johnson, PhD, research assistant professor of Pediatrics (Adolescent Medicine); and Esrea Perez-Bill, data assistant in the Evaluation, Data Integration, and Technical Assistance (EDIT) Program):

- Systems-informed empowerment evaluation
- Building Communities of Practice
- Evaluation capacity and general member surveys and key informant interviews
- Training and other workforce development

**Dissemination and Impact Core** (includes Karen Gutzman, MSLS, MA, head of research assessment and communications; Annette Mendoza and Mao Soulakis, research assessment and communications librarians at Galter Library)

- NNLM Beacon repository, featuring open and FAIR infrastructure (Findable, Accessible, Interoperable, Reusable) for the national network
- Development of impact reports and a national data visualization challenge
- Training development and delivery

The NEC has hit the ground running, and is pleased to report that as of this printing, which occurs at roughly the halfway point of Year 1 of the five-year grant, we have achieved several goals focused on internal processes, NNLM partners, and community and capacity building.

**Internal Resources and Processes:**

- Successful migration of the data warehouse from the University of Washington and timely turn-around of NNLM and NIH data requests
- Launch of [NEC homepage](#) on the NNLM website
- Internal and external communication channels established

Support for NNLM Partners:

- Evaluation forms updated and made available on the NUCATS REDCap
- Evaluation Working Group launched and growing
- Continuous improvement projects, including NLP of qualitative evaluation data with Yuan Luo, PhD, professor of Preventive Medicine (Health and Biomedical Informatics)
- Requirements gathering for Beacon repository with key stakeholders

**Community and Capacity Building:**

- Enhancement of NNLM evaluation resources
- NNLM Member survey coordination and oversight
- Highlight underrepresented voices and evaluation needs
- Training and engagement evaluation support and development of training opportunities

**How can the work of the NEC help you?**

The team members of the NEC bring decades of combined experience in evaluation, capacity building, and continuous improvement. If you would like to learn more connect with us! Join the [NEC newsletter](#), keep an eye out for NEC trainings hosted on the [NNLM site](#), and watch for updates to our [NEC webpage](#). Please contact NEC Director, [Kristi Holmes, PhD](#), director of Galter Library and professor of Preventive Medicine (Health and Biomedical Informatics) with additional questions.



# High-Impact Factor Research

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## Featured Core

### Biostatistics Collaboration Center

The mission of the Biostatistics Collaboration Center (BCC) is to support investigators conducting high-quality, innovative, health-related research by providing expertise in biostatistics, statistical programming and data management. The BCC contributes to all types of research, including basic science, clinical, epidemiological and health services. BCC affiliated faculty and staff work with investigators in all aspects of research, from study design and grant development to data capture, statistical analysis and final scientific reporting. The center supports all levels of investigators, from multi-year collaborations to one-time consultations.

Core activities include:

- Initial Consultations
- Grant Writing
- Statistical Consultation
- Programming Consultation
- Data Management Consultation

The BCC's scope encompasses non-cancer research at Feinberg, Northwestern and its clinical partners; Lurie Cancer Center members should contact the [Quantitative Data Sciences Core \(QDSC\)](#). The Center also partners with the [Shirley Ryan AbilityLab](#) and the [Stanley Manne Research Institute](#) to provide biostatistics expertise to their investigators. Investigators planning large, prospective multicenter clinical trials or observational studies can find additional resources by contacting the [Northwestern University Data Analysis and Coordinating Center](#).

#### Contact:

Leah J. Welty, PhD, Director  
Samantha Victor, Financial Administrator  
bcc@northwestern.edu

[Project request form](#)

#### Location:

Department of Preventive Medicine  
680 N. Lake Shore Drive  
Suite 1400

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