Breakthroughs

Feinberg School of Medicine Research Office

September 2022

Advancing Lung Health Through Discovery-Based Research

By Melissa Rohman

In 1964, the publication of the U.S. Surgeon General's report linking smoking to poor lung health highlighted the importance of lung health and spurred research efforts and discoveries that have continued to advance the knowledge of lung diseases and the factors driving them. Nevertheless, chronic lung disease is still the fourth leading cause of death in the U.S., making chronic lung disease both a research and clinical priority for many academic medical centers across the U.S. — including the Feinberg School of Medicine.

"All of this work that has been done in previous decades has led us to the point where there's a real appreciation of the importance of lung disease as a public health problem and as a clinical problem that we need to address as a health system," said Scott Budinger, MD, the Ernest S. Bazley Professor of Airway Diseases and chief of Pulmonary and Critical Care in the Department of Medicine and of Cell and Developmental Biology.

Feinberg's approach to addressing chronic lung disease is through a discovery-based research infrastructure, which integrates multi-disciplinary clinical care with leading-edge, at-scale research.

"We think of every patient coming into our clinical center as a potential research subject," Budinger said. "Any time a sample is taken from a patient as part of planned care, if the patient is willing to consent to it, the residual material that would normally get thrown in the garbage will come to our laboratories where we've developed tools to study these very small samples and get tremendous amounts of information from them."

Northwestern Medicine®

The goal of this infrastructure is to provide optimal care and treatments for patients with chronic lung diseases, at Northwestern Medicine across Chicagoland, according to Budinger.

"We want to think about how we can organize care for patients with lung disease across the Chicago region using our health system, and then take that information that we're generating from those patients to inform discovery-based research so we can leapfrog forward in terms of developing treatments," Budinger said.

Research in Action

In Feinberg's Department of Pulmonary and Critical Care, discovery-based research for lung disease has accelerated through the expansion of research initiatives and the creation of advanced pulmonary disease subspecialty clinics and programs, including Northwestern Medicine's Lung Transplant Program.

Lung transplant outcomes are the worst among solid organ transplants. Only half of patients survive beyond five years, underscoring a dire need for more research-driven treatment options.

According to Budinger, every patient enrolled in the Lung Transplant Program is offered the opportunity to be a subject of research and the vast majority elect to do so.

In a recent study published in the *Journal of Clinical Investigation*, Melissa Querrey, a fourth-year student in the Medical Scientist Training Program (MSTP), worked with Budinger and Ankit Bharat, MBBS, the Harold L. and Margaret N. Method Professor of Surgery and chief of Thoracic Surgery, to understand why some patients have poor outcomes after a lung transplant.

Specifically, the investigators analyzed how blood immune cells called non-classical monocytes (NCMs) retained in the donor lung activate a pathway that attracts damaging neutrophils

(continued on page 2)

Lung Research *(continued from cover page)*

from the host into the newly transplanted lung.

The study identified a protein on these cells called CD11b, which acts as a "molecular brake" and can reduce the activation of damaging cells known to cause primary graft dysfunction (PGD), a leading culprit in lung transplant failure.

Impact of COVID-19 on Lung Health

Discovery-based research also enabled Feinberg investigators to quickly shift to studying COVID-19 and its impact on lung health at the onset of the COVID-19 pandemic.

Based on experiences with more than 20 patients, including the first lung transplant procedure in the U.S. for patients dying from COVID-19, a study published in *JAMA* led by Bharat showed that these patients had similar outcomes compared to transplant patients without COVID-19.

"Even for the most critically ill COVID patients, their long-term survival is similar. You can take these sick patients off of the ventilator, transplant them and still achieve good outcomes," Bharat said.

A team of investigators led by Budinger, Richard Wunderink, MD, professor of Medicine in the Division of Pulmonary and Critical Care, Alexander Misharin, MD, PhD, associate professor of Medicine in the Division of Pulmonary and Critical Care, and Benjamin Singer, MD, the Lawrence Hicks Professor of Pulmonary Medicine, also discovered that COVID-19 pneumonia spreads slowly across the lung, explaining why it causes long-term illness in these patients.

Their study, published in *Nature*, was the first to examine immune cells from the lungs of COVID-19 pneumonia patients and also identified critical targets to treat severe SARS-CoV-2 pneumonia.

Identifying At-Risk Populations

In May, Northwestern and the American Lung Association (ALA) began recruiting patients for a first-of-its-kind longitudinal study, the ALA Lung Health Cohort Study, which will track and analyze lung health in 4,000 healthy adults ages 25 to 35.

The national 40-site study aims to explore how exposures including smoking, vaping, alcohol, pollution, physical activity and COVID-19 affect participants' respiratory health and may influence the development of chronic lung disease.

"We really need to understand populations and their risk factors in a much better way if we're going to prevent this common chronic condition. We need to understand who's susceptible, we need to understand the earliest forms of impairment, and then in the long run, see if we can implement strategies that actually stop it from progressing based on those risk factors," said Ravi Kalhan, MD, MS, professor of Medicine in the Division of Pulmonary and Critical Care, of Preventive Medicine in the Division of Epidemiology, and co-principal investigator of the study.

Mercedes Carnethon, PhD, vice chair and the Mary Harris Thompson Professor of Preventive Medicine, is also a co-principal investigator.

Additional research led by Kalhan and Gabrielle Liu, MD, instructor of Medicine in the Division of Pulmonary and Critical Care, found that using a race-specific approach to interpret spirometry — which determines a person's lung function against the healthy population of someone of the same age, height, weight, sex and race — may be normalizing worse lung health in Black and non-white adults compared to white adults.

Study participants were Black and white adults from the longitudinal CARDIA (Coronary Artery Risk Development in Young Adults) study, which has been ongoing since 1985.

"Used alone, spirometry is missing a number of people who have evidence of lung disease," Liu said. "So, what could we be doing in addition to spirometry to identify people early on before they have significant impairment in their lung function and identify people who have some evidence that they have some lung damage. By identifying those people, we can find ways to prevent them from progressing to full lung disease."

CONTENTS

Northwestern Launches New Center for Human Immunobiology

By Gina Bazer

Northwestern has established the Center for Human Immunobiology (CHI) with the goal of bringing together interdisciplinary scientists and clinicians to uncover the molecular mechanisms of the immune system and translating new discoveries into innovative cures for immune-regulated diseases.

The center will be directed by Stephanie Eisenbarth, MD, PhD, the incoming chief of the Division of Allergy and Immunology in the Department of Medicine.

"Understanding how the immune system fights new viruses, controls the growth of cancer, inappropriately responds to allergens, and targets the body's own tissues is critical to human health, and the interdisciplinary teams we plan to build will help us examine these questions through multiple lenses," said Eisenbarth, who previously served as the associate chair of research in the Department of Laboratory Medicine and co-director of the Program in Translational Biomedicine at Yale University.

The new center — which has been allocated 9,000 square feet of newly renovated lab space on the Chicago campus in the Tarry Building — will unite trainees, clinicians and immunologists spanning 28 departments at Feinberg to stimulate innovative new approaches to treat diseases caused or amplified by the immune system. The medical school has also allocated funds to recruit new scientists at the forefront of research in immunology to the faculty.

"While we have learned a tremendous amount about the cells and molecules of the immune system in the past three decades, we are only recently learning how to apply this knowledge to treatments that effectively re-direct the immune response," said Eisenbarth, who is also a professor of Allergy and Immunology and of Pathology. "By bringing together a community of researchers focused on immunology, we can help each other's science grow."

CHI aims to attract students and investigators through fellowship programs and will provide funds for early-stage research. Another major focus will be expanding the number of clinical trials underway at Northwestern in a wide range of areas, including allergies, emerging infectious diseases, autoimmune diseases and neuroimmune diseases. The center will also become a hub for community engagement with leading-edge clinical interventions of immune-mediated diseases.

Eisenbarth's own work focuses on allergies, which she described as "one of the biggest mysteries in immunology." In her laboratory, her team is studying the role of dendritic cells, T-cells and B-cells in allergy, as well as exploring a possible link between allergies and leaky gut, which could translate into a treatment that would prevent anaphylactic food reactions in children.

Eisenbarth has already recruited M. Cecilia Berin, PhD, formerly the Endowed Chair and Hugh A. Sampson Professor of Food Allergy Research at Mount Sinai in New York. Berin joined Northwestern in August as the inaugural Bunning Professor for Food Allergy Research.

"With its incredible research enterprise and spirit of collaboration, Northwestern is the ideal home for a center that intends to unlock the mysteries of the immune system — ultimately transforming the way we manage the immune-regulated diseases and improving the lives of our patients," Eisenbarth said.

Eisenbarth is also a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University

More information about the new center can be found here and both Northwestern faculty and trainees can apply to become a CHI member here.

Eisenbarth will jointly run a lab with her husband, Adam Williams, PhD, who joined Feinberg as an associate professor of Medicine in the Division of Allergy and Immunology.

Graduate Student/Post-Doc Events and Opportunities

Being Bipolar in a Polarized World – Art Exhibit
September 16 through October 20
10:00 a.m. to 10:00 p.m.

This exhibit created by Chicago artist Kelly Matthews exemplifies how the personal is political within the context of art. Having been diagnosed with bipolar disorder after years of destructive behavior, Matthews understands the meaning of the "edge" and often steps close to it when creating art, resulting in bold and fearless work. Her history with addiction, rehab, recovery and bipolar disorder lend her a unique perspective on the world around her. Her work deals with social and political issues and erasing the stigma of mental illness.

Norris University Center
Dittmar Gallery
1999 Campus Drive, Evanston
More information

Mechthild Esser Nemmers Prize in Medical Science Lecture
Tuesday, September 20
4:30 to 5:30 p.m.

Attend the keynote lecture presented by the 2022 recipient of the Mechthild Esser Nemmers Prize in Medical Science, Jeremy Nathans, MD, PhD.

Robert H. Lurie Medical Research Center
Hughes Auditorium
303 E. Superior St., Chicago
More information

BrainUp 5K Run/Walk
Saturday, September 24
8:00 to 10 a.m.

Join Team Malnati Brain Tumor Institute (MBTI) as we raise critical funds and awareness for brain cancer research. Help us give hope, not fear, to those affected by a brain cancer diagnosis. Together, we will find a cure!

Maggie Daley Park
337 E. Randolph St., Chicago
More information

The Epidemiology of Preventable Analytic Errors
Thursday, September 29
Noon to 1:00 p.m.

With the growth of team science and big data, the increasing complexity of scientific research may make preventable errors more common. This talk will present results from the first scoping review of articles in clinical and translational science retracted for reasons related to errors in data capture, management or analysis.

Robert H. Lurie Medical Research Center
Baldwin Auditorium
303 E. Superior St., Chicago

Or online via Zoom
More information

Research in the News

***US News & World Report*, August 4**
What Parents Can Do to Protect Kids From Heart Disease
Amanda Marma Perak, MD, MS, was featured.

***New York Times*, August 14**
What Types of Exercise Do You Need to Reduce Dementia Risk?
Sandra Weintraub, PhD, was featured.

***USA Today*, August 16**
Queer Conversion Therapy is Still Practiced in the US. Experts Say We Need to Talk about It.
Jagadisa-devasri Dacus, PhD, MSSW, was featured.

***Crain's Chicago Business*, August 22**
Northwestern Testing Telehealth to Treat Three Risky Behaviors at Once
Bonnie Spring, PhD, was featured.

***Yahoo! News*, August 25**
The Nuances of Breastfeeding as a Black Mother
Shawn M. Smith, MD, was featured.

***US News & World Report*, August 29**
Hypertension in Pregnancy is Getting More Common for Gen Z Women
Sadiya Khan, MD, MsC, was featured.

Improving the Supply and Demand of Effective Treatments

Sara Becker, PhD, inaugural director of the newly formed IPHAM Center for Dissemination and Implementation Science (CDIS)

What are your research interests?

Broadly speaking, my research aims to answer the question, "How do we bridge the gap between public health/medical knowledge (what we know) and public health/medical practice (what we do)?" To address this question, my team conducts programmatic research that integrates both patient-focused dissemination (e.g., direct-to-consumer marketing, technology-assisted interventions) and provider- and organization-focused implementation (e.g., multi-level implementation approaches, workforce development) strategies. The overarching objective of our work is to increase both the demand for and supply of effective treatments in community and clinical settings.

What is the goal of your research?

The ultimate goal of my research, as well as the new Center for Dissemination and Implementation Science, is to advance equitable access to evidence-based public health and medical interventions by accelerating the impact of research across the translational continuum. I am also passionate about mentorship and team science. Two other major goals of my work are to: a) train the next generation of implementation scientists and practitioners and b) foster collaborations to advance cutting-edge dissemination and implementation science at Feinberg, locally, domestically and globally.

How did you become interested in this area of research?

My training has been multi-disciplinary spanning clinical psychology, economics, organizational change management and health services research. I first became interested in this area of research over 20 years ago before I had the vocabulary to realize that my interests could be considered "dissemination and implementation science." As an undergraduate, I had a dual concentration in psychology and economics, with particular interest in how incentives could be used to spark organizational change. I then worked in business as a strategy consultant for The Boston Consulting Group, where I worked in the change management and marketing practice areas, helping large companies to embrace strategic change. Following my tenure in business, I sought a PhD in clinical psychology and became interested in how the principles I had learned in business could be applied to increase the uptake of effective behavioral treatments. It wasn't until I became a postdoctoral fellow that I realized there was a young field of study aligned with my interests. While writing my first grant proposal in 2011, the NIH announced its inaugural Training Institute in Dissemination and Implementation Research in Health. Attending that institute was a formative experience for me and provided me with the vocabulary and conceptual grounding I needed to begin building a career in this area of research. I have been an enthusiastic adopter and advocate of all things dissemination and implementation science ever since!

What types of collaborations are you engaged in across campus (and beyond) and how can people get in touch with you?

In my first few weeks at Northwestern, I have launched collaborations with the Center for Prevention Implementation Methodology (Ce-PIM), the Bridges program, the Northwestern University Clinical and Translational Science Institute (NUCATS), the Center for Health Information Partnerships (CHIP) and the Center for Health Services and Outcomes Research (CHSOR). Beyond campus, I maintain an active partnership with Rosecrance Health Network, which is based in Rockford, Illinois. Even though I have relocated, I am deeply committed to maintaining my long-standing partnerships with behavioral health organizations and specialty addiction programs throughout New England, as well as my collaborations with colleagues domestically and globally.

How is your research funded?

My research as principal investigator (PI) or multiple PI has been funded predominantly by the National Institutes of Health, though I have been fortunate to have grants from the Substance Abuse and Mental Health Services Administration, the President's Emergency Plan for AIDS Relief and the Agency for Healthcare Research and Quality. As a co-investigator or mentor, my work has been further supported by the Centers for Disease Control and Prevention, the Patient-Centered Outcomes Research Institute, the Society for Emergency Academic Medicine and an array of foundation and institutional grants.

Who inspires you?

I am continually inspired by the individuals who seek health services and the organizations that provide their care. They inspire me to make it easier to access and deliver effective care.

Identifying Psychosocial Factors that Impact Health

Emily Fu, student, in the Clinical Psychology PhD Program

Where is your hometown?
My hometown is Atlanta, Georgia.

What sparked your interest in science or medicine?
I volunteered at a women's health clinic throughout college, which showed the grim reality of health disparities, access to care and effects of health on quality of life. At the same time, I was a research assistant in a clinical health psychology lab, which involved interacting with patients for data collection. These two experiences showed me how I could intertwine my two interests — psychology and health — and use research and clinical science to understand psychosocial risk factors, accessible treatment and prevention of health issues.

What are your research interests?
My research interests are psychosocial factors that contribute to behaviors associated with poor health, translation of research to real-world practice and accessible mental health care. I'm particularly interested in the prevention and management of pediatric obesity through addressing caregiver mental and physical health. I am also interested in implementation science, which studies methodologies to promote uptake of evidence-based interventions in settings of interest.

What are you currently working on?
I currently have a NRSA/F31 training grant to develop a measurement tool to quantify how well a family-based pediatric obesity intervention is individually tailored to participants' needs. I hope to use this tool to test whether tailored interventions can change behaviors associated with pediatric obesity, which has many contributing factors such as individual, interpersonal, community, cultural, and environmental. A one-size-fits all approach, on the other hand, can overload participants with irrelevant information and miss their unique needs.

Additionally, I work on an interdisciplinary team of investigators and clinicians examining the implementation and evaluation of the Collaborative Behavioral Health Program for depression and anxiety in primary care. The collaborative care model addresses the shortage of psychiatrists and limited access to mental health services by integrating behavioral health clinicians in primary care clinics who access an off-site consulting psychiatrist. I've loved learning from the interdisciplinary team and how to collect organizational and operational data to develop strategies to adequately implement an evidence-based program into an existing system.

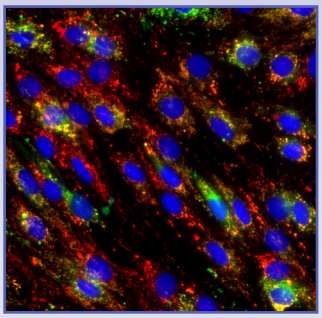
Please tell us about a defining moment in your education at Feinberg thus far.
That's definitely a hard question because I've had an accumulation of so many seminal and foundational experiences throughout my training at Feinberg. A defining moment has been the opportunity to work with the interdisciplinary Collaborative Behavioral Health Program team and see how everyone comes together with their different experiences and perspectives to create important research questions, methodology and carry out a study for the shared goal of improving patient care and health outcomes.

What do you hope to do with your degree / what are your plans for post-graduation?
What I love about the clinical psychology degree at Feinberg is we are trained equally in research and clinical care. As student therapists, we gain first-hand exposure to the patient population we hope our research can serve, and we experience delivering the treatments we hope to disseminate. I would like to eventually be a scientist-practitioner seeing patients and conducting effectiveness-implementation hybrid trials for health psychology interventions. I also hope to use implementation science to improve reach and accessibility of existing evidence-based interventions to promote community and population health. I hope to be part of interdisciplinary teams to learn from each other and put our heads together to conduct breakthrough research.

Breakthroughs Podcast

Cardiovascular disease (CVD) is the number one cause of death globally, and nearly half of all U.S. adults are currently at risk for heart attack and stroke. Hossein Ardehali, MD, PhD, is working to understand the role of iron and metabolic processes in cardiovascular disease and develop new therapies that target iron accumulation in people with CVD and many other chronic diseases.

Listen to the episode



Equipping and Empowering the Research Enterprise

Piper Hawkins-Green, associate director of IRB Compliance and Reliance

Where is your hometown?
I was born and raised in Chicago.

What led you to Northwestern?
I graduated from the University of Illinois at Chicago with a Bachelor of Arts degree in Sociology and a minor in Psychology. As an undergraduate student, I had the opportunity to engage in observational research and completed an honors thesis within my major. This was my first exposure to and my point-of-entry into human research and it piqued my interest; I knew I wanted to stay in this field. Shortly after completing my degree, I was led to Northwestern University after learning of a position within the then newly formed Social Behavioral IRB Office on the Evanston Campus. I was excited about the position and immediately applied because the role aligned directly with my degree and afforded me the opportunity to engage and support the research community.

What are you currently working on?
This is an exciting and innovative time for the compliance, education and reliance teams. Our teams are currently working to bolster each respective program through the development of electronic solutions that will meet the demands of our institution's growing research portfolio. We are developing educational tools and resources that will support staff and the research community, and we are internally streamlining our processes to further improve our efficiency and metrics.

How does your work support the research enterprise at Feinberg?
My work, and that of my IRB Office colleagues directly facilitates and supports the success of the research enterprise at Feinberg. We provide guidance, education and relevant compliance tools to equip and empower Feinberg — and the university's research community — to conduct sound, ethical, diverse, cutting-edge human research that minimizes risks to participants and maximizes the benefits for both the participants and society at-large. My work and that of my IRB Office colleagues facilitates the innovation and breakthrough discovery that are the hallmarks of Feinberg's research enterprise.

Why do you enjoy working at Northwestern?
There are so many reasons why I love working at Northwestern University. It is such a pleasure to work with a remarkable group of super-talented individuals who are passionate about safeguarding the welfare of human research participants, while facilitating science and discovery. My work at Northwestern is very meaningful and I find that satisfying. Within the IRB Office, we frequently use the hashtag #BestPlacetoWork when describing our work culture and environment, which is a reflection of how intentional we are as a team to foster engagement, inclusion, diversity and morale. Working at Northwestern University has afforded me opportunities to make amazing professional and personal connections, advance my career and education, create relevant programming and resources, build high-functioning teams and meaningfully contribute to the university's research eminence and impact.

New Faculty

Rendong Yang, PhD, joined as associate professor in the department of Urology in July 2022. Previously, Yang was assistant professor at the University of Minnesota. He received his PhD in bioinformatics from the China Agricultural University. His lab is interested in the integrative analysis of large-scale datasets to understand the initiation and progression of diseases. The long-term goal is to elucidate the genetic mechanisms of human diseases, such as cancer.

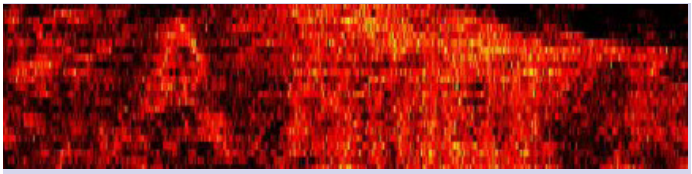
NUCATS Corner
Clinical and Translational Sciences Institute

NUCATS Launches New Service Request Form

To enhance accessibility to the many research resources available to you at NUCATS, the Institute has launched a new Service Request Form for various request needs, including:

- NUCATS Membership
- Clinical Research Support (e.g., regulatory, finance, recruitment, and multi-center study support)
- REDCap Support and Training
- NMEDW Access
- Education & Career Development Event Registrations
- Community Engagement Resources
- Grant Development Support (including Studios)
- Letters of Support for Grant Submissions
- Access to the Comprehensive Facilities and Other Resources Document
- General Inquiries and Feedback/Suggestions

The new Service Request Form can also be found on the NUCATS website, under «Need Help?» You will also find contact information for our NUCATS Navigator team members on that same webpage.



New Technique Improves Proteoform Imaging in Human Tissue

Investigators led by Neil Kelleher, PhD, professor of Medicine in the Division of Hematology and Oncology and of Biochemistry and Molecular Genetics, have developed a new imaging technique that increases the detection of intact proteoforms by fourfold when compared to current protein imaging methods. The imaging technique, detailed in a recent paper published in *Science Advances*, provides high-resolution, high-throughput imaging of proteoforms, or all modified versions of proteins.

Read the full story

NIH News

Announcing the 2023 NIH Loan Repayment Program Application Cycle and a New LRP Director

The next NIH Loan Repayment Program (LRP) application cycle opens September 1 and closes November 17. Each new LRP recipient can receive up to $100,000 to repay qualified educational debt in exchange for a two-year commitment to research. NIH Institutes and Centers have increased their collective funding commitment to the LRPs with more than $90 million in awards in each of the last two program cycles. Along with the new LRP, Matthew Lockhart, MBA, was named the new director of the Division of Loan Repayment within the NIH Office of Extramural Research earlier this summer.

2022-2023 Virtual NIH Grants Conference and PreCon Events: New Name! New Approach! Deeper Dive!

Introducing the new NIH Grants Conference and PreCon Events. All events will be hosted within the virtual conference center. Topics include NIH loan repayment, navigating early career funding opportunities, research misconduct and integrity, foreign collaborations and human subjects. This conference will take place from August through February, to allow time for the information to digest. Through this new model, there is the opportunity to dive deeper into issues and build time for additional Q&A, case studies and conversation.

Statement on NIH plans to speed access to federally funded research results

The White House Office of Science and Technology Policy (OSTP) issued updated policy guidance directing federal agencies to expedite access to results of federally funded research. NIH has long championed principles of transparency and accessibility in NIH-funded research and supports this step by the Biden Administration. Over the coming months, NIH will work expeditiously to develop and share its plans for implementing the OSTP policy guidance.

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Sponsored Research

PI: CongCong He, PhD, assistant professor of Cell and Developmental Biology

Sponsor: National Institute of Drug Abuse

Title: "Autophagic regulation of cocaine abuse"

The objective of this multi-PI R01 application is to determine how the autophagy machinery regulates the development of cocaine abuse. Cocaine is one of the most widely abused drugs, and produces a variety of behaviors including reward, craving, and relapse. Although many pharmacological targets and behavioral interventions have been explored, there are no FDA-approved medications for reducing cocaine use or treating relapse in cocaine addicts.

Autophagy is a key lysosomal degradation pathway that targets cargos for degradation either selectively or non-selectively and is temporally and spatially controlled by more than 30 autophagy genes. Autophagy occurs constitutively at a basal level and can be further induced by stress. We recently discovered that an autophagy-related protein Becn2/Beclin 2, which forms a complex with the autophagy-inducing class III phosphatidylinositol 3-kinase Vps34, is a novel regulator of acquisition of cocaine reward behaviors via dopamine (DA) D2 receptors (D2Rs). Knockout of Becn2 (but not its homolog Becn1) globally or specifically in DA neurons protects mice from cocaine-induced locomotor stimulation, conditioned place preference, and intravenous self-administration. UPLC/mass spectrometry profiling indicates that cocaine-induced accumulation of DA, but not other neurotransmitters, is attenuated by Becn2 depletion. In addition, pharmacologically inhibiting autophagy kinases upstream of Becn2, including ULK1 and Vps34, mimics the effects of Becn2 depletion/mutation on cocaine-induced reward behaviors and DA accumulation, suggesting the existence of a ULK1-Vps34-Becn2 axis in the regulation of cocaine responses. Furthermore, biochemical analyses reveal that D2R is a degradation target of Becn2 via binding to a Becn2-associated protein GASP1. Genetic inhibition of Becn2 or pharmacological inhibition of ULK1 similarly increases striatal presynaptic D2Rs.

Based on these preliminary data, we propose to investigate the hypothesis that the ULK1-Vps34-Becn2 autophagy axis controls vulnerability to cocaine abuse by selectively regulating D2R autoreceptor endolysosomal trafficking and degradation in DA neurons. Using a combination of genetic, imaging, biochemical, cellular and behavioral approaches, we aim to answer the following questions: How does Becn2 function in DA neurons to regulate acquisition of cocaine-taking, dose response, reinstatement of cocaine-seeking, and D2R catabolism (Aim 1)? Is there a ULK1-Vps34-Becn2 autophagy pathway in DA neurons regulating these cocaine reward behaviors, and if so, how does it work (Aim 2)? We anticipate that with these two fundamentally related aims, our study will establish the function and mechanism of a Becn2-centered autophagy axis in the regulation of D2 receptor metabolism, DAergic function, and cocaine-related reward behaviors. A better understanding of this novel molecular mechanism may provide new options for developing treatments for cocaine abuse and additional types of drug abuse.

Read more about this project

PIs: Dennis H. Li, PhD, MPH, assistant professor of Psychiatry and Behavioral Sciences (General Psychiatry) **and Nanette Benbow, MAS, research assistant professor of Psychiatry and Behavioral Sciences**

Sponsor: National Institute of Mental Health

Title: "Promoting Sustained Viral Suppression Through Implementation of an Adapted Evidence-Informed Low-Barrier Care Model in a System of HIV Primary Care Clinics"

The goal to end the HIV epidemic in the United States can only be achieved if People with HIV (PWH) achieve sustained viral suppression (VS). However, more than half of PWH in the U.S. do not receive regular HIV care, due to social and structural factors like stigma and discrimination, poverty and care complexity, as well as conditions like mental health and substance abuse. Additional approaches to care delivery, especially for PWH experiencing compounding barriers, are needed to close the gap in sustained care and VS.

Low-barrier care (LBC) is a package of implementation and care engagement strategies developed specifically to address barriers experienced by PWH with complex needs and has been shown to significantly improve VS among this population. The original model of standalone LBC clinics, however, may have challenges in scalability due to feasibility and limited reach to PWH within large areas. In contrast, adapting LBC strategies for integration into existing HIV primary care sites has the potential to facilitate greater use of this promising model of HIV care while also engaging more PWH with unaddressed needs.

The overarching goal of this proposal is to evaluate the implementation and effectiveness of adapted LBC strategies in a system of 12 HIV population-centered health homes (PCHHs) funded by the Chicago Department of Public Health (CDPH) using a pragmatic trial design. Guided by the EPIS framework, we will achieve this goal through three specific aims: (1) Facilitate adoption, adaptation, and implementation of LBC strategies by PCHHs using a learning collaborative. Learning collaboratives are widely used, evidence-based implementation strategies. We will assess the process of adoption and implementation of LBC strategies using mixed methods. (2) Evaluate site-specific and system-wide effectiveness of integrated LBC strategies at improving sustained care and VS. Using a single-arm, pre–post trial design, we will assess if rates of retention in care and VS improve in the two years following ramp-up of LBC strategies. We will also examine contextual factors and implementation fidelity using mixed methods to explain variability in outcomes across PCHHs. (3) Assess implementation cost and sustainment of LBC strategies among PCHHs. We will examine implementation costs over time and plans for sustainment using mixed methods. Our proposal directly responds to RFA-AI-21-024 and is consistent with the NIH Office of AIDS Research's high priority of implementation science to improve HIV service delivery and reduce disparities in treatment. Results from this study will facilitate the use of LBC strategies in new settings to reach PWH with complex needs.

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.

Healthy Eating Research: COVID-19 and Socioeconomic Recovery Efforts

More information

Sponsors: Healthy Eating Research (Robert Wood Johnson Foundation)

Submission deadline: October 12

Upper amount: $250,000 over 18 months

This opportunity aims to fund research on how COVID-19-related relief and recovery policies, and now the post-pandemic recession, impact child health and well-being. Healthy Eating Research is interested in understanding how pandemic-driven social and economic programs and policies related to poverty reduction – such as financial payments to families, income assistance programs, housing assistance or housing security programs, and increased access to social services – impact child obesity, diet quality, food and nutrition security, and other relevant child and family health outcomes among lower-income families and populations of color.

Mental Health Award – Sleep and Circadian Science

More information

Sponsors: Wellcome Trust

Submission deadline: October 19

Upper amount: Up to $3 million over 5 years

As part of the new strategic focus, Wellcome aims to develop new and improved early interventions for anxiety, depression and psychosis, in ways that reflect the priorities and needs of people experiencing these conditions. This award aims to advance understanding of the roles played by sleep and circadian rhythm disturbance in the development and resolution of anxiety, depression and psychosis. This work involves advancing scientific understanding of how brain, body and environment interact in the trajectory of these problems; and finding new and useable ways to predict, identify and intervene as early as possible.

Blood Brain Barrier Response to Antibodies Targeting Beta-Amyloid (R01 – Clinical Trial Not Allowed)

More information

Sponsors: National Institute of Neurological Disorders and Stroke and National Institute on Aging

Submission deadline: November 10

Upper amount: Up to $500,000 per year, maximum project period is five years

This funding opportunity announcement solicits applications designed to increase understanding of cellular and molecular mechanisms that can be targeted to protect the blood-brain barrier, and thus brain blood vessels, during therapeutic interventions that target beta-amyloid.

Maintaining Immunity After Immunization (U01 Clinical Trial Not Allowed)

More information

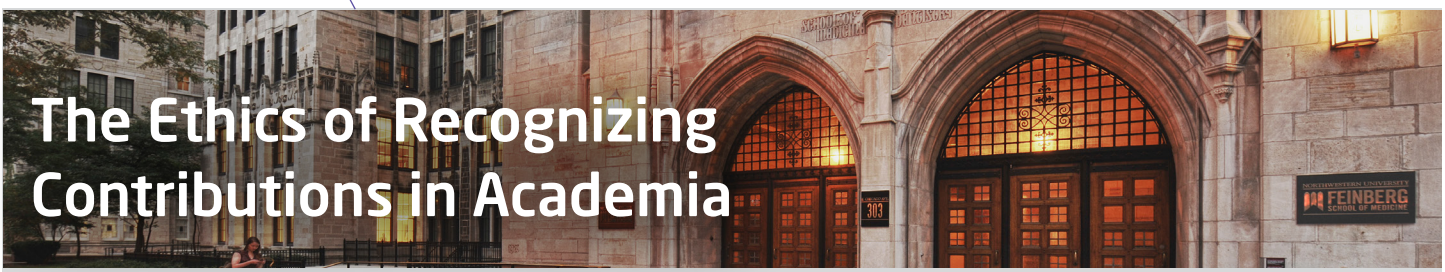
Sponsors: National Institute of Allergy and Infectious Diseases

Submission deadline: January 13

Upper amount: Up to $450,000 per year, maximum project period is five years

The purpose of this funding opportunity announcement is to support individual single-project cooperative agreements that undertake research to identify the requirements for induction and maintenance of durable protective immunity following vaccination against infectious agents. Applications are sought that propose to define the immune mechanisms and components that lead to sustain immunity, and/or identify common versus distinct durable immune mechanisms triggered by vaccines compared to natural infection.

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.



The Ethics of Recognizing Contributions in Academia

Our days are filled with a wide range of collaborations. Be it playing a team sport, working in an office, or conducting research – we constantly collaborate with one another. These collaborations are built upon an even wider range of individual contributions that ensure success. When collaborating, several factors might impact how we think about others' contributions. For example, the amount of time spent on tasks, the type of contribution and the quality of execution are among factors that impact our satisfaction with others' contributions. Once the work is complete, our experience of the collaborative process remains significant as the *recognition of individual contributions comes into play*, which could involve formal or informal praising and/or monetary compensations, depending on the context.

From an ethical perspective, the way we act in, and think about collaborations demonstrate our values, virtues and principles. Our behavior in collaborative efforts shows how much we care about treating others fairly, how we think about justice in general or how grateful and respectful we are towards others' abilities, talents and contributions.

Like all other collaboration types, academic collaborations are also prone to ethical issues, especially when it comes to recognizing contributions. Becoming co-authors of journal publications is the most common means of recognizing contributions in academia. However, with an increase of international collaborative research and an increase in the average number of authors per publication, ethical recognition of contributions in academic publications has become significantly more complicated. In the presence of more co-authors from different backgrounds and research areas conducting an array of completely different tasks, clarifying who should be an author and where in the byline each co-author should be listed becomes bewildering. In response, Mohammad Hosseini, PhD postdoctoral scholar in the Department of Preventive Medicine, and Kristi Holmes, PhD, professor of Preventive Medicine and director of Galter Health Sciences Library, are leading the conceptual work to improve systems of academic recognition.

By exploring *Contributor Role Ontologies and Taxonomies* (which provide standard lists of roles to recognize individual contributions to publications), their work aims to enhance transparency and consistency about the reporting of conducted tasks, improve fairer attribution of credit and responsibilities, and subsequently, better understand the roles and capacity needed to successfully complete work. In a recent article entitled "Evolution and Adoption of Contributor Role Ontologies and Taxonomies" published in the journal *Learned Publishing*, an international team of experts led by Hosseini and Holmes offer suggestions to better acknowledge various contribution-types from different disciplines and improve adoption and integration of contributor role ontologies and taxonomies (Figure 1).

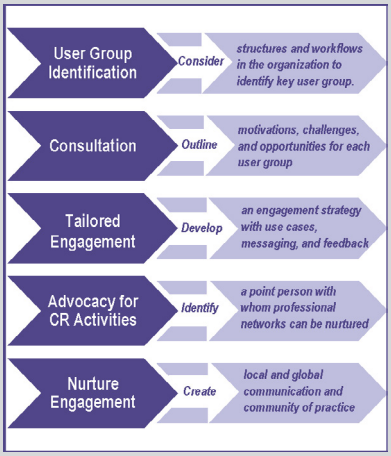


Figure 1. Strategies to improve user advocacy and adoption of Contributor Role Ontologies and Taxonomies.

These suggestions ensure that academic contributions are reflected accurately and ethically, and *credit is given where credit is due*. In a related effort, and in collaboration with research librarian, Q. Eileen Wafford, Hosseini and Holmes have conducted a systematic review of ethics of contributor role ontologies and taxonomies (CROTs) to guide the debate with the most important themes discussed in the literature. This review specifies 20 ethical issues that are most frequently mentioned in the literature and accordingly, provide four rec-ommendations for developers of CROTs including:

- Compile and promote comprehensive instructions that explain how CROTs should be used and that note common pitfalls of employing them in practice
- Improve the coherence of used terms
- Provide translations of roles in languages other than English
- Communicate a clear vision and strategy about future development plans

Incorporating contributor roles into the scholarly publication workflow can promote a more positive culture for team science and protect the integrity of research. This work fosters an inclusive environment, and ultimately helps to recognize and sustain the range of interdisciplinary contributions required to drive modern collaborative research.

Learn more about the Ethics of Authorship and the significance of this research to translational sciences.

High-Impact Factor Research

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Featured Core

Center for Advanced Microscopy & Nikon Imaging Center

The Center for Advanced Microscopy (CAM) offers a variety of light and electron microscopy service, and provides Northwestern investigators access to cutting-edge imaging technologies and research expertise.

CAM's core services include:

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The Nikon Imaging Center (NIC) is an integral component of CAM, serving as a learning center for Northwestern staff, scientists and students by introducing cutting-edge imaging technology to Northwestern investigators. The center's mission is to augment basic research by providing access to state-of-the-art imaging equipment, provide training courses and organize symposia on light microscopy techniques and serve as an instrument evaluation and testing site for new equipment from Nikon.

CAM is supported by Nikon, the Feinberg School of Medicine, the Department of Cell and Developmental Biology and the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

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