

Breakthroughs

Feinberg School of Medicine Research Office

May 2021



Transforming Pediatric Medicine Through Research

By **Melissa Rohman**

Much of one's lifetime trajectory is determined in childhood, yet despite the importance of evidence-based early intervention and specialized healthcare for children, pediatric research funding from the NIH has remained relatively flat over the past two decades. There is a great need to engage scientists in pediatrics and child health and an effort is underway on the Northwestern Chicago campus to meet that need.

In June 2019, the [Stanley Manne Children's Research Institute](#), the pediatric research enterprise of [Ann and Robert H. Lurie Children's Hospital of Chicago](#), moved from its former home in the Lincoln Park neighborhood of Chicago to the [Louis A. Simpson and Kimberly K. Querrey Biomedical Research Center](#) on Northwestern University's downtown Chicago medical campus.

This relocation allowed the institute and its investigators to take advantage of the new state-of-the-art facilities in Simpson Querrey, just a block away from Lurie Children's Hospital, and facilitate additional research opportunities and collaborations with faculty at Feinberg School of Medicine and investigators at the [Shirley Ryan Ability Lab](#).

This move also gave the institute the opportunity to restructure its research focus to prioritize improving the understanding of key biological themes such as injury repair and regeneration that may have long-term effects over the course of a child's life, investing in genetics and neurogenetics research and determining how to recruit more children for clinical trials.

"We really want to understand those early developmental effects where we can intervene early and give children a more sustained, enhanced quality of life and the ability to contribute to society," said [Patrick Seed, MD, PhD](#), president and chief research officer of the Manne Research Institute. "It's also very informative for our investigators to be in places where they can go over to the hospital and actually see some of the children that their research is aimed to treat."



Patrick Seed, MD, PhD

Redefining Impact

All research at Lurie Children's is conducted through the Manne Research Institute. Seed's goal is to build an institute-wide culture that redefines the meaning of "impact" — to move beyond metrics solely based on peer-reviewed publications and funding to instead measure how the institute's research is impacting surrounding communities, healthcare system decision-making and health policy on local and national levels.

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Transforming Pediatric Medicine *(continued from cover page)*

“Science is most impactful when we combine it with different types of advocacy,” said Seed, who is also the Children’s Research Fund Professor of Basic Science and a professor of [Pediatrics](#) in the Division of [Infectious Diseases](#) and of [Microbiology-Immunology](#). “We’re trying to take this much more holistic view about impact, recognizing that there are some aspects of research that are incredibly impactful to legislatures and inspire investment and change but may not be equaled by a big impact factor in the journals in which they are published.”

The institute’s research is divided into three areas — laboratory and basic science research, clinical trials and population health and outcomes research. All are essential for improving the understanding of the multi-generational impact of diseases and how structures in society and healthcare effect the health of children.

“There’s not just an opportunity but a responsibility to think about the multi-generational effects of different structures in our society, in our health system or from a pandemic, in ways that are really exciting to contemplate. By understanding them better, we can have greater and more long lasting impact for our patients and their communities,” said [Matthew Davis, MD](#), the Founders’ Board Centennial Professor and chair of the Department of [Pediatrics](#).



Matthew Davis, MD

Davis is also executive vice president and chief community health transformation officer at Lurie Children’s and leads the hospital’s [Patrick M. Magoon Institute for Healthy Communities](#).

Translational Research and Collaborations

[William Muller, MD, PhD](#), associate professor of Pediatrics, is the scientific director for clinical and community trials at the Manne Research Institute. Muller facilitates the transformation of basic science and laboratory findings that have promise as clinical interventions into testing through clinical trials and works

with investigators involved in industry-sponsored studies.

Currently, COVID-19 vaccine clinical trials in children are in the works, according to Muller, whose goal is to recruit more individuals from underrepresented communities for this study and all future clinical trials at the Manne Research Institute. [Listen to a podcast](#) with Muller talking about COVID-19 vaccine clinical trials.



William Muller, MD, PhD

“The pandemic really highlighted neighborhoods and communities within Chicago that were disproportionately impacted by the pandemic. Those are the same communities that have been disproportionately underrepresented in clinical trials, and there are a lot of historical reasons for that, but that’s not an excuse,” Muller said. “We need to find a way to really reach out to those communities, find out what’s important to them and find out what we can do to make participation in clinical studies something that they would consider doing.”

Steering the Manne Research Institute’s community, population health and outcomes research is the [Mary Ann & J. Milburn Smith Child Health Outcomes, Research and Evaluation Center](#), which aims to advance innovative research to improve the wellbeing, health and healthcare of diverse populations of children in Chicago and communities across the U.S.

The center, directed by [Michelle Macy, MD, MS](#), associate professor of Pediatrics in the Division of [Emergency Medicine](#), supports research that advances knowledge about the natural history, biological, psychological, social and environmental causes of prominent child health problems and partners with community-based organizations and engages with policymakers to translate this research into clinical and public health interventions and policy.



Michelle Macy, MD, MS

“The center serves as a connector for translational research activities,” Macy said. “We will be more responsive to research questions if we engage with our end users of scientific information and the innovations that we develop upfront.”

Members of the center include [Nia Heard-Garris, MD, MSc](#), assistant professor of Pediatrics in the Division of [Advanced General Pediatrics and Primary Care](#), who studies how adverse experiences in early childhood, such as [racial discrimination](#), impact a child’s health in the long-term. In response to the COVID-19 pandemic, Heard-Garris incorporated pandemic-related stress into her research.

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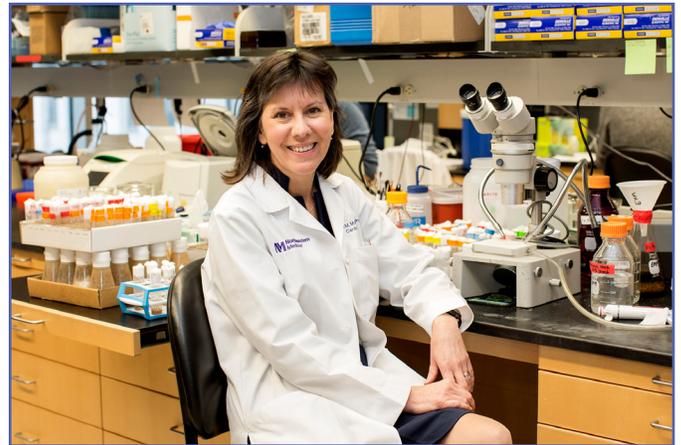
Feinberg Faculty Elected to the American Academy of Arts and Sciences

Three members of the Feinberg faculty have been elected members to the [American Academy of Arts and Sciences](#), one of the nation’s oldest and most prestigious honorary societies.

[Elizabeth M McNally, MD, PhD](#), [Thomas McDade, PhD](#), and [Catherine Woolley, PhD](#), are among this year’s class of more than 250 artists, scholars, scientists and leaders in the public, non-profit and private sectors.

The academy was founded in 1780 by John Adams, James Bowdoin and others who believed the new republic should honor exceptionally accomplished individuals and engage them in advancing the public good. The academy’s dual mission remains essentially the same more than 200 years later, with honorees from increasingly diverse fields and with the work now focused on the arts and humanities, democracy and justice, education, global affairs and science.

“While it is noteworthy that we continue to elect members more than 240 years after the academy’s founding, this is about more than maintaining traditions,” said Nancy C. Andrews, Chair of the Board of Directors of the American Academy. “We recognize individuals who use their talents and their influence to confront today’s challenges, to lift our spirits through the arts and to help shape our collective future.”



Clockwise from top: Elizabeth McNally, MD, PhD, Catherine Woolley, PhD, and Thomas McDade, PhD.

Northwestern University Feinberg School of Medicine

COVID-19 Vaccine Safety Webinar

May 11, 2021

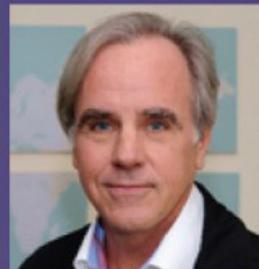
PRESENTED BY:



Eric G. Neilson, MD

Vice President
for Medical Affairs

Lewis Landsberg Dean



Robert L. Murphy, MD

John Philip Phair Professor
of Infectious Diseases

Executive Director of the Institute for
Global Health

Northwestern Medicine
Feinberg School of Medicine

In a recent webinar for the Feinberg community, Dean Eric G. Neilson, MD, and Robert Murphy, MD, talked about COVID-19 vaccine safety and effectiveness and responded to vaccine-related questions. [Watch the video.](#)

Graduate Student/Post-Doc Events and Opportunities

Asian, Pacific Islander and Desi American Heritage Month

May is Asian, Pacific Islander, and Desi American (APIDA) Heritage Month, when the Northwestern community celebrates the diverse APIDA community on campus. The Northwestern APIDA community hosts a variety of speakers, events, shows, workshops and performances throughout the month in addition to all those hosted by the Multicultural Student Affairs (MSA). Visit the [MSA](#) website for more information about programming throughout the month of May.

Contact: MSA, msa@northwestern.edu

Sunrise Yoga Group Exercise (All Levels)

Tuesday, May 25 and June 1

Time: 7 a.m. to 7:30 a.m. CST

Online via Zoom [Register here](#)

This class begins with quiet reflection and a thorough warm-up that energizes and awakens the body through various yoga postures, combined with breathing, balance and mobility techniques. The perfect way to start your day feeling grounded, focused and clear.

Please review the [Virtual Group Exercise Online Consent](#) before participating in any virtual classes.

To view more group exercise sessions, [click here](#).

Contact: recreation@northwestern.edu

BIPOC Support Circle With CAPS: Intersectionality

Thursday, June 3

Time: 4 p.m. to 5 p.m. CST

Online via Zoom [Register here](#)

The BIPOC support circle is a discussion and community space for BIPOC-identified students seeking a supportive and brave space to gather, develop a sense of connection and experience collective and individual healing. This session will honor the intersecting identities folx hold and acknowledge layers of oppression that come with that. The role of a trusted community, building alliances (inter and intrapersonally) and radical self-love will be discussed.

[Click here](#) to learn more about this and other CAPS programming.

Contact: rachael.collins@northwestern.edu

3D Printing Tutorial With Daniele Procissi, PhD

Tuesday, June 15

Time: 1 p.m. to 2 p.m. CST

Online via Zoom (Email [Cynthia Collazo](mailto:Cynthia.Collazo@northwestern.edu) to receive the link)

Join [Daniele Procissi, PhD](#), for a guide on using the 3D printer as part of the Department of Radiology's Center for Translational Imaging and T32 Training Grant in MRI Seminar Series.

[More information](#)

Contact: cynthia@casillas@northwestern.edu

Research in the News

HealthDay, April 6

[COVID Shot Earlier in Pregnancy Better for Baby: Study](#)

Emily Miller, MD, MPH, was featured.

This research was also featured in *U.S. News & World Report* and Fox 32.

U.S. News & World Report, April 7

[Jail Dims Hopes for Recovery for Young People With Mental Illness.](#)

Linda Teplin, PhD, was featured.

This research was also featured in *HealthDay* and *Crain's Chicago Business*.

Crain's Chicago Business, April 9

[No Pain, No Gain for Those With PAD: Northwestern Study Finds](#)

Mary McDermott, MD, was featured.

Reuters, April 9

[Moderna vaccine antibodies last at least six months; lung transplant can save some COVID-19 survivors](#)

Ankit Bharat, MBBS, was featured.

NBC Chicago, April 19

[Study: Single COVID Vaccine Dose Insufficient for Individuals Who Had Mild Cases of Virus](#)

Thomas McDade, PhD, was featured.

The New York Times, April 26

[Five Takeaways From the New Food Allergy Law](#)

Ruchi Gupta, MD, was featured.

- This research was also featured in *The Washington Post*.

Crain's Chicago Business, April 26

[Northwestern Researchers Detail Opioid Fatalities During Stay-at-Home Period](#)

Maryann Mason, PhD, was featured.

NBC Chicago, April 27

[New Study Provides Clarity on Impacts of Stress on Fertility](#)

Tarun Jain, MD, was featured.

Fox News, April 29

[Remote learning during coronavirus caused stress, anxiety in students, survey finds](#)

Tali Raviv, PhD, was featured.

Improving the Diagnosis, Management and Treatment of Neuro-infectious Diseases at Home and Abroad

Igor Koralnik, MD, the Archibald Church Professor of Neurology and chief of Neuro-infectious Disease and Global Neurology in the Ken and Ruth Davee Department of Neurology



Igor Koralnik, MD, is the Archibald Church Professor of Neurology and chief of [Neuro-infectious Disease and Global Neurology](#) in the Ken and Ruth Davee Department of [Neurology](#). He is also director of the [Program for Global Neurology](#) at the [Institute for Global Health](#) and oversees the [Neuro COVID-19 Clinic](#) in Northwestern Medicine's [Comprehensive COVID-19 Center](#). His research focuses on determining better methods to diagnosis, manage and treat viral infections of the nervous system, particularly [how the SARS-CoV-2 virus causes neurological complications](#) in different patient populations who currently have or had COVID-19, and improving this process overall in areas with limited resources.

Q&A

What are your research interests?

My research focuses on two major and interconnected areas: infections of the nervous system and global neurology. In particular, we want to understand how SARS-CoV-2 causes neurologic complications in two very distinct populations. The first includes hospitalized patients with severe COVID-19 pneumonia who develop encephalopathy, which is an alteration of mental function that goes from mild confusion all the way to coma. The second consists of the “long-haulers” who had mild COVID-19 and never required hospitalization yet develop thereafter persistent and debilitating neurologic symptoms including brain fog, headache, dizziness, alteration of smell and taste, as well as intense fatigue.

Another area of interest of my laboratory is to understand the role of the human virome in degenerative and autoimmune diseases of the nervous system. We have developed a novel assay called ViroFind, which allows us to detect every virus known to infect humans – more than 500 species – in clinical samples, identify viral variants and, potentially, novel viruses. We are currently using this assay in samples from patients with Alzheimer’s, Parkinson’s, ALS and multiple sclerosis.

Finally, we have helped create a Global Neurology Program in Lusaka, Zambia, where we are investigating how infections of the nervous system can be best diagnosed and treated in resource-limited settings.

What is the ultimate goal of your research?

The goal of our research is to find the best way to diagnose, manage and treat viral infections of the nervous system. We also want to determine whether viruses can act as triggers, causal factors or even biomarkers in degenerative or autoimmune diseases of the nervous system.

Our Global Neurology Program aims to improve neurologic health worldwide and provide neurological care, research and education to underserved populations. We strive to bridge the gap between resource-rich and resource-limited settings, and provide neurological care where it is needed the most. For example, together with colleagues we provided for the first time in-country neurologic education to Zambian physicians and trained them to become neurologists. In addition, we mentor Zambian investigators to become neuroscientists. We also provide unique exposure to our U.S. neurology trainees in global neurology and neuro-infectious diseases.

How did you become interested in this area of research?

I became interested in the field of neuro-infectious diseases when I was a medical student in Switzerland in the early ‘80s at the beginning of the HIV epidemic. At that time, HIV had just been discovered as the cause of AIDS. During my first clinical rotations, I saw many young people developing opportunistic infections of the nervous system that were unheard of at the time in the setting of immunosuppression. One of them was triggered by a reactivation of Human polyomavirus 2, or the JC virus, which is innocuous in healthy people but causes progressive multifocal leukoencephalopathy (PML), a devastating disease of the brain in patients with AIDS. I decided to do my medical doctorate thesis on how HIV affects the nervous system, and I was lucky to have the opportunity to come to the U.S. for a postdoctoral fellowship at the NIH thereafter and to stay in the U.S. for neurology training.

I developed my interest in global neurology while mentoring residents, fellows and junior faculty at our [Global Neurology Program](#) in Zambia. It started as a one-person operation 15 years ago and has now evolved into multi-institution effort called the Zambia Institute for Neurologic Care, Research and Education (ZINCARE).

In view of my background in neurovirology and neuroimmunology, I was naturally interested in the neurological complications of COVID-19, and we opened one of the first dedicated neuro-COVID-19 clinics in the country in May 2020.

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Exploring Epidermal Tissue Development

Marihan Hegazy, Driskill Graduate Program in Life Sciences



Marihan Hegazy, a sixth-year student in the Driskill Graduate Program in Life Sciences ([DGP](#)), studies the molecular mechanisms that promote cell-cell interaction and epidermal differentiation in the laboratory of [Kathleen Green, PhD](#), the Joseph L. Mayberry, Sr., Professor of [Pathology](#) and Toxicology.

Q&A

Where is your hometown?

I was born in Egypt right before my family moved to Chicago. Although I was raised in Chicago, I used to visit Egypt every summer to see my family.

What are your research interests?

My general research interest lies in exploring the molecular mechanisms that govern tissue development and homeostasis that can be disrupted in patients afflicted with genetic and autoimmune diseases. Thus, Dr. Kathleen Green's lab is a great fit because the lab uses a variety of techniques to study the role of an intercellular junction called the desmosome in epidermal development, function and disease. Furthermore, Kathy has a strong track record of mentoring students that go on to successful careers in cell biology.

What exciting projects are you working on?

My main project is focused on uncovering the trafficking mechanisms of one of the adhesive components of the desmosome called desmoglein-1 (Dsg1). Previous members in the laboratory found that Dsg1 is important for epidermal differentiation and morphogenesis. Certain functions of Dsg1 have been found to require its proper localization on the plasma membrane.

I aim to elucidate the role of an endosomal trafficking complex called the retromer in regulating Dsg1 recycling to the plasma

membrane. We are also testing the effect of a small molecule chaperone that enhances retromer activity on the trafficking and function of both wild-type and disease-associated Dsg1. This could be therapeutically relevant because disruption of Dsg1 localization results in a severe inflammatory skin condition called SAM syndrome (Severe dermatitis, multiple Allergies and Metabolic wasting).

I also have side projects focused on understanding the role of the actin cytoskeleton in regulating Dsg1 stabilization on the plasma membrane, as well as the impact of phosphorylation of the Dsg1 cytoplasmic tail in epidermal stratification, which is important for the formation and maintenance of the multilayered and regenerating epidermis.

What attracted you to your program?

I believe the opportunity to rotate labs to experience different fields in science and medicine made DGP's umbrella format exciting for me. I also appreciated that the faculty and students foster a caring and collaborative environment making the DGP program an ideal environment for my growth as a scientist.

What has been your best experience at Feinberg?

My best experience at Feinberg is attending lectures by esteemed scientists featured in seminars such as the Lectures of Life Sciences. These events allow me to expand my knowledge in a variety of topics.

How would you describe the faculty at Feinberg?

All the faculty that I have interacted with at Feinberg are amazing. They are knowledgeable in their field, care about their students and do their best to guide students to become great scientists.

What do you do in your free time?

I am a homebody. From a young age, I have always enjoyed reading fiction books in my spare time. My husband and I also like exploring different cuisines on the weekends.

What are your plans for after graduation?

Although I am currently leaning towards staying in academia, I can see myself working in either academia or industry. Therefore, I plan to find a post-doctoral position in the near future before making a final decision.

Welcome New Faculty

[Hiam Abdala-Valencia, PhD](#), joined as associate professor of [Medicine in the Division of Pulmonary and Critical Care](#). Abdala-Valencia earned her PhD in Pharmaceutical Sciences from the University of Nantes in France. She applies next-generation sequencing technology and integrative wet-lab approaches to basic and translational research of lung disease, including but not limited to asthma, chronic obstructive pulmonary disease, pulmonary fibrosis and acute lung injury. Abdala-Valencia works to understand the systemic influences on lung biology in health and disease, such as the impact of the central metabolism and the epigenetic control of developmental checkpoints. She is the director of the Integrative Genomics branch of the Metabolomics Development Core Facility at Robert H. Lurie Comprehensive Cancer Center of Northwestern University. Among other collaborative projects, Abdala-Valencia's contribution as a team scientist was instrumental in the success of the transcriptomic profiling of patients with SARS-CoV-2. This work was published in [Nature](#) (Grant, R.A. *et al.* 2021).



Coordinating Research at CFAAR

Kathy Boon, MPH, senior program administrator at the Center for Food Allergy and Asthma Research



Kathy Boon, MPH, senior program administrator at the Center for Food Allergy and Asthma Research ([CFAAR](#)), helps manage research studies and operations for the center, part of the Institute for Public Health and Medicine ([IPHAM](#)).

Q&A

Where are you originally from?

I was born and raised in Chicago, in the Humboldt Park neighborhood.

What is your educational background?

I have a Bachelor's degree in community health and wellness with a minor in social work. I also have a Master's degree in public health.

Please tell us about your professional background.

I have worked in the field of public health since the year 2008. I've interned at the Illinois Caucus for Adolescent Health, researching sexuality education in the elderly population. I've worked as a health educator for youth guidance at Roberto Clemente High School. I also had the opportunity to work as a bilingual lung health educator for the Respiratory Health Association at Stroger Hospital.

Transforming Pediatric Medicine *(continued from cover page)*

[Seema Shah, JD](#), the Founders' Board Professor of Medical Ethics and associate professor of Pediatrics in the Division of [Advanced General Pediatrics and Primary Care](#), studies the ethics of pediatrics and global health research and recently co-authored an editorial [published](#) in *Pediatrics* exploring the idea of enrolling minors in COVID-19 vaccine clinical trials. [Jennifer Kusma, MD, MS](#), instructor of Pediatrics in the Division of Advanced General Pediatrics and Primary Care, studies Medicaid eligibility and access for children with complex medical needs and how state-level decisions impact individual children's care.

The center also houses the [Voices of Child Health in Chicago](#) program, a triannual citywide survey of Chicago households with children that aims to better understand the issues impacting child health in the city and, most recently, measure the impact of the COVID-19 pandemic on Chicago families and children. It is also closely connected to the [Institute for Public Health and Medicine's Center for Community Health](#), which brings together investigators from the Manne Research Institute and Feinberg.

Why do you enjoy working at Northwestern?

Northwestern is a great institution comprised of so many talented faculty and staff. It's an honor to be able to work and learn from people with such different backgrounds and expertise.

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

I currently work for the Center for Food Allergy & Asthma Research as a senior program administrator. I support the center by managing research studies in addition to our center operations.

What is your favorite part of the job?

My favorite part of the job is being able to work with so many talented and passionate people who are truly motivated by the work that they do.

What exciting projects are you working on?

I'm a bit biased, so I think all of the projects I work on are exciting. Our center conducts research in the area of food allergy and asthma. No one study is the same, and I think that's what makes our work so exciting!

What do you like to do in your spare time?

In my spare time, I love to spend time with my husband and 6-year-old son and 2-year-old twins. Travel is something I also enjoy, so looking forward to doing more of that soon!

"Through our multi-faceted projects, it's our goal to strengthen relationships and collaborations with investigators in IPHAM who focus chiefly on adults. It's those types of connections that are providing opportunities for more partnerships and collaborations, as well as opportunities for Northwestern students," Davis said.

In the past four years, the Manne Research Institute more than doubled its research award funding from \$34.7 million in fiscal year 2016 to \$71.8 million in fiscal year 2020. As Feinberg scientists across the research enterprise begin to collaborate with the Manne Research Institute, Seed said more growth is on its way.

"We will build on the successes to date and work to maximize the impact of our youth-focused research across its translational spectrum, from basic science to population health," Seed said. "Expect to see more exciting work from our teams in the months and years ahead."

NIH News

Fiscal Year (FY) 2020 By the Numbers: Extramural Investments in Research

Every year, NIH reports their grant funding and success rates for research supported through traditional annual appropriations. In FY 2020, NIH received \$41.6 billion – \$30.8 billion of which was awarded to 56,169 new and renewed meritorious extramural grants (excludes research and development contracts). This investment was up \$1.3 billion from FY 2019 (4.4 percent increase), with 1,157 more grants funded (2.1 percent increase). Awards were made to [2,650](#) academic universities, hospitals, small businesses and other organizations throughout the U.S. and internationally.

NIH also awarded 11,332 competing Research Project Grants (RPGs) in FY 2020, 297 more than FY 2019. \$22.6 billion was spent on RPGs, an additional \$1 billion (4.9 percent) over the previous year, with the average size per award increasing by \$13,065 (2.4 percent). The RPG success rate in FY 2020 was 20.6 percent (55,038 competing applications and 11,332 awards).

The application success rate for R01-equivalent grants, which make up the majority of RPGs, was 21.4 percent. NIH received 36,250 applications, funding 7,767 of them. The average grant size and overall total spending for R01-equivalent grants increased in FY 2020, compared to the previous year, to \$559,680 (2.1 percent increase) and \$17.4 billion (5.9 percent increase), respectively.

New Loan Repayment Program to Launch

Beginning September 1, the Research on Emerging Areas Critical to Human Health (REACH) Loan Repayment Program (LRP) will be available for all extramural applicants. The new subcategory intends to recruit and retain highly qualified health professionals to conduct research designed to pursue major opportunities and gaps in biomedical research and expand clinical research in emerging areas of human health. Emerging areas are considered new areas of biomedical and biobehavioral research that are ripe for targeted investments that can have a transformative relevance and impact for years to come. LRPs counteract financial pressure by repaying up to \$50,000 annually of an investigator's qualified educational debt in return for a commitment to engage in NIH mission-relevant research. [Read more](#) about the new subcategory, and visit the [NIH Division of Loan Repayment](#) website to learn more about how to apply for this and other LRPs.

Notification: eRA to Phase Out Use of Internet Explorer

Last year, [Microsoft announced](#) that it would be discontinuing its support of Internet Explorer (IE) 11 by August 17. As a result of that announcement, eRA is phasing out the use of IE for all eRA systems due to security concerns. **By July 19, eRA systems will no longer be available when using the IE browser.** It is recommended that eRA users switch to other supported browsers, such as Mozilla Firefox, Google Chrome, Safari (and Microsoft Edge once IE is phased out), when using eRA systems.



Life Course Research Visual Toolkit Launched

Life course research embraces the complexity of health and disease development, tackling the extensive interactions between genetics and the environment over a lifetime. Recent advances in computational analytics, computer science and data collection allow for the integration of a "life course" theoretical framework and complexity science for understanding health and development across the lifespan.

A new [NCATS Life Course Research Visual Toolkit](#) now serves to increase knowledge about innovative life course research methods by providing content that is widely available and accessible to researchers across multiple disciplines through

both longer and shorter visual formats presented by national and international experts in life course research.

In addition to the six recorded webinars, there are shorter 5- to 15-minute videos to allow for personalizing an educational approach for anyone interested in learning more about life course research methods and applications. The video archive, available in the [CLIC Education Clearinghouse](#) and [Life Course Visual Toolkit YouTube Channel](#), includes both broad overviews of the subject matter and 'how to' videos that describe best practices for applying data science and complex methodological techniques to life course research questions.

Sponsored Research

PI: [D. James Surmeier, PhD](#), chair of the Department of Physiology and the Nathan Smith Davis Professor of [Physiology](#)

Sponsor: National Institute of Neurological Disorders and Stroke

Title: Determinants of Basal Ganglia Pathology in Parkinson's Disease



The motor symptoms of Parkinson's disease (PD) result from the degeneration of substantia nigra dopamine (SN DA) neurons and the basal ganglia pathophysiology triggered by this loss. However, the mechanisms that underlie the progressive degeneration of SN DA neurons, the regional network pathophysiology this causes and PD symptoms are uncertain.

A major obstacle to answering these questions is the lack of a progressive animal model of PD amenable to the application of advanced tools for the interrogation of neurons and neural networks. Recently, our group has developed a new mouse model of PD that overcomes this obstacle, giving us an extraordinary opportunity.

The model is predicated on the observation that loss of functional mitochondrial complex I (MCI) – a critical element in the electron transport chain – is a common feature of the SN in PD patients. We found that knocking out the catalytic subunit of MCI (*Ndufs2*) in SN DA neurons leads to progressive, levodopa-responsive parkinsonism in mice. Importantly, in this so-called MCI-Park mouse, DA neuron pathology begins in nigrostriatal axons and then proceeds to the somatodendritic region – reproducing a key feature of human PD pathology. This human-like staging of pathology should provide clues not only to PD pathogenesis, but also to the roles played by regional network pathophysiology in the emergence of motor symptoms.

We can rigorously characterize the mechanisms underlying the emergence of motor deficits in the MCI-Park model through a battery of complementary cutting-edge optical, electrophysiological, optogenetic, chemogenetic, electrochemical, anatomical, behavioral and transcriptomic approaches.

[Read more](#)

PI: [Elisa Gordon, PhD, MPH](#), professor of Surgery in the [Division of Organ Transplantation](#)

Sponsor: National Institute of Diabetes, Digestive and Kidney Diseases

Title: Integrating a Culturally Competent APOL1 Genetic Testing Program Into Living Donor Evaluation



Living donor (LD) kidney transplantation is the optimal treatment for patients with end-stage kidney disease (ESKD). However, LDs take on a higher risk of future ESKD themselves. African American (AA) LDs have an even greater, 3.3-fold, risk of ESKD than white LDs post-donation. Because evidence suggests that Apolipoprotein L1 (APOL1) risk variants contribute to this greater risk, transplant nephrologists are increasingly using APOL1 testing to evaluate LD candidates of African ancestry. However, nephrologists do not consistently perform genetic counseling with LD candidates about APOL1 due to a lack of knowledge and skill in counseling about APOL1.

Without proper counseling, APOL1 testing will magnify LD candidates' decisional conflict about donating, jeopardizing their informed consent. Given their elevated risk of ESKD post-donation, and AAs' widely-held cultural concerns about genetic testing, it is ethically critical to protect AA LD candidates' safety through APOL1 testing in a culturally competent manner to improve informed decisions about donating.

No transplant programs have integrated APOL1 testing into LD evaluation in a culturally competent manner. Clinical "chatbots," mobile apps that use artificial intelligence to provide genetic information to patients and relieve constraints on clinicians' time, can improve informed treatment decisions and reduce decisional conflict. The chatbot "Gia," created by a medical genetics company, can be adapted to any condition. However, no chatbot on APOL1 is currently available. No counseling training programs are available for nephrologists to counsel AA LDs about APOL1 and donation in a culturally competent manner. Given the shortage of genetic counselors, increasing nephrologists' genetic literacy is critical to integrating genetic testing into practice. The objective of this study is to culturally adapt and evaluate the effectiveness of an APOL1 testing program for AA LDs at two transplant centers serving large AA LD populations (Chicago, IL, and Washington, DC).

[Read more](#)

Funding

Damon Runyon-Rachleff Innovation Award

[More information](#)

Sponsor: Damon Runyon Cancer Research Foundation

Application Deadline: July 1

Amount: \$400K - \$800K

The Innovation Award is designed to provide support for the next generation of exceptionally creative thinkers with “high-risk/high-reward” ideas that have the potential to significantly impact the understanding of and/or approaches to the prevention, diagnosis or treatment of cancer. The award is specifically designed to provide funding to extraordinary early-career investigators who have an innovative new idea but lack sufficient preliminary data to obtain traditional funding. It is not designed to fund incremental advances. The research supported by the award must be novel, exceptionally creative and, if successful, have the strong potential for high impact in the cancer field.

Systems Approach to Understand Mechanisms of Heterogeneous Response to Influenza (R01 Clinical Trial Not Allowed)

[More information](#)

Sponsor: National Institute of Allergy and Infectious Diseases

Letter of Intent Due: August 9

Application Deadline: September 8

Upper Amount: \$1M in FY2022

Synopsis: The National Institute of Allergy and Infectious Diseases (NIAID) intends to support the identification of mechanisms behind heterogeneous responses in the population to influenza infection and/or vaccination through development and application of computational tools. This initiative will support research on the following topics:

- Identification of the mechanisms regulating the effects of host factors including age, sex, microbiome, immune history or immune status on the host response to natural infection or vaccination
- Identification of markers of severe outcome to infection
- Identification of markers of response/nonresponse to seasonal influenza vaccine

NIAID seeks applications that propose well-integrated, cross-disciplinary research teams with strong computational expertise.

Lupus Research Program (LRP) Transformative Vision Award

[More information](#)

Sponsor: Department of Defense

Letter of Intent Due: August 24

Application Deadline: September 22

Upper Amount: \$2.5M

Synopsis: The LRP’s mission is to fund research to understand, prevent and diagnose lupus and to improve treatments. The proposed research must be relevant to active-duty service members, veterans, military beneficiaries and/or the American public. Applications should propose an intervention either at the individual and/or healthcare system level to improve the quality of life for individuals living with lupus. Example interventions include, but are not limited to, access to healthcare resources, outcomes research, symptom and disease control, comparative effectiveness research and issues and challenges that, when addressed, make day-to-day living with lupus easier and life more fulfilling.

[View COVID-19 funding opportunities](#)

[View more funding opportunities](#)

Koralnik *(continued from page 5)*

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

I have been at Northwestern for only about a year and a half, but I have already been blessed to meet great collaborators inside and outside of the Neurology department. My neuro-COVID research is done in collaboration with Drs. [Ayush Batra](#) and [Eric Liotta](#) in [Stroke and Neurocritical Care](#), Dr. [Josh Cahan](#) in [Behavioral Neurology](#), and Drs. [Phyllis Zee](#) and [Matthew Maas](#) in [Sleep Medicine](#).

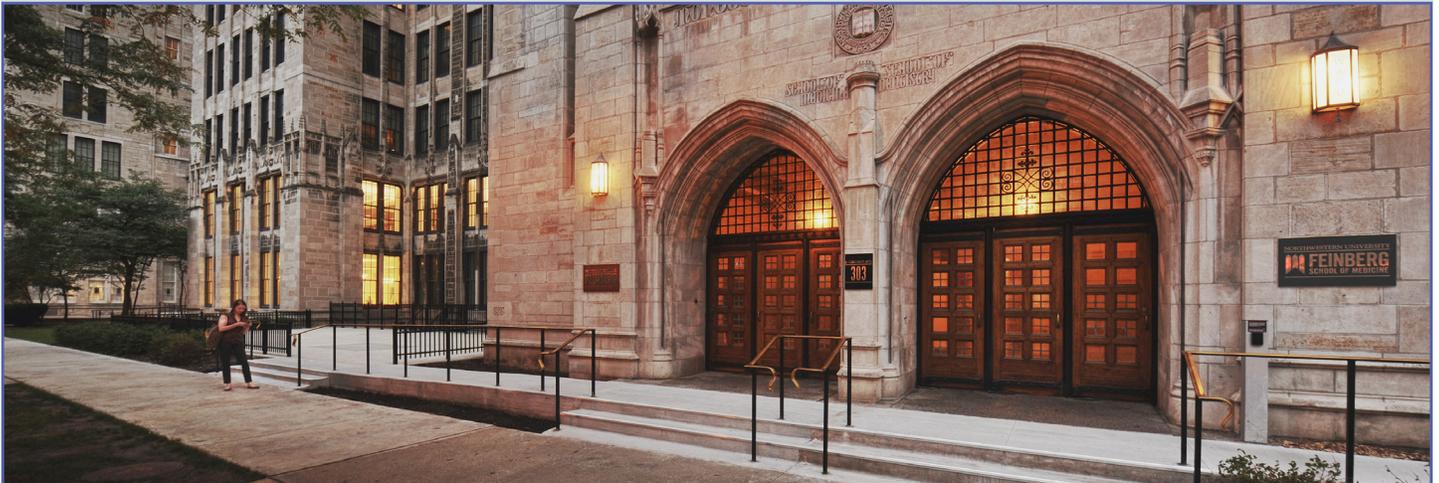
In addition, 10 neurologists in other divisions of our department have agreed to see some patients in the Neuro-COVID-19 clinic to meet a very high demand for appointments, and they therefore participate in both the clinical care and the research done at the clinic. I have also initiated collaborations in the departments of [Ophthalmology](#), [Psychiatry and Behavioral Sciences](#) and [Neurosurgery](#) at Northwestern, as well as [Physical Medicine and Rehabilitation](#) at the [Shirley Ryan AbilityLab](#), on various aspects of COVID-19 research.

Our research and unique patient population have also triggered a broad interest in the biotech and pharmaceutical industries, and many companies have been reaching out to us to discuss collaborations on biomarkers and therapeutic interventions for neurologic manifestations of COVID-19. Of course, I also interact with the many members of the [Comprehensive COVID-19 Center](#) in the Department of [Medicine](#), a multi-disciplinary clinic dedicated to the total care of post-acute COVID-19 patients at Northwestern. Finally, I am the director of the Global Neurology Program and collaborate with other members of the [Institute for Global Health](#).

How is your research funded?

Our research is funded through a number of approaches. We have been funded for more than two decades by various institutes at the NIH. In addition, we are funded by different foundations for disease-specific projects. Furthermore, some of our projects are sponsored by industry. Finally, we also benefit from the philanthropic support of generous donors who have decided to join the fight against COVID-19.

Improve the Reach of your Research with Metadata



By Joelen Pastva, Head, Collection Management and Data Services

The [oft-cited](#) definition of metadata as “data about data” seems so simple to understand, and yet it obscures the fact that the concept in the wild can sometimes be difficult to pin down. Metadata is both ubiquitous and invisible. Essential for some, but an afterthought for others. How is this so? And perhaps more importantly, why does it matter? A researcher’s knowledge of a project and access to its outputs are things that can be taken for granted. But both are highly dependent on the time during which that project was active and all of its surrounding context, including collaborators, protocols, methods, software, etc.

Metadata provides a structured way to capture information that is essential in making research and its associated outputs discoverable, reusable and sharable for demonstrating impact and investigating new projects. But the responsibility of supplying metadata often falls to the researcher, and it can often seem like unnecessary work. The following are some practical use cases to demonstrate why metadata is worth the effort.

Discovery

As [incentives](#) have grown to make research and datasets publicly available due to funder mandates and journal policies, so too has the need to make them findable. Although it may seem sufficient to deposit data and other outputs in an appropriate repository, doing so without sufficient metadata serves little purpose because the files remain essentially hidden. Repositories vary in the metadata options they provide, but a good rule of thumb is to be as descriptive as possible so that it is clear what your data is and how it can be used. A README file can often do the trick in serving as a guide to the context surrounding the data, including file-naming conventions and tools used. Taking full advantage of other descriptive fields such as project title, keywords, co-author names and grant information will allow

for the data to be discovered more broadly, extending the reach of the project in its field. Many [field-specific standards](#) exist which provide common data elements and thesauri that can be helpful in guiding best practices for improved interoperability across systems.

Reuse

The lives of data and scholarship don’t end once a project is finished. Sharing data and research outputs encourages their [citation](#) and reuse in validating results, performing future investigations, and identifying new opportunities for collaboration. This adds value to research dollars already spent and enables innovation and advancement in the field. Reuse would not be possible without metadata, which supplies the description and context necessary to allow outsiders to approach works and data with a clear understanding of how they are to be understood and used.

Impact

Aside from enabling proper citation, well-described and attributed work with clearly articulated relationships to funding agencies and affiliated institutions is incredibly important in helping to track activities of interest for the promotion and tenure process. Research information management systems increasingly rely on automated processes to harvest data about research activities to measure impact. Incomplete metadata can make it more difficult to locate activities, or to make the connections necessary to understand the impact of research teams and grant funds.

Contact your Galter [liaison librarian](#) to learn more about how rich metadata for your research outputs and datasets can vastly improve the reach of your work. With a little extra planning, metadata can be easily integrated into project planning, article and data submission, and long-term preservation activities to ensure that your research remains accessible, findable and usable for the greatest impact.

High-Impact Factor Research

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(continued on next page)

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Featured Core

Recombinant Protein Production Core

The [Recombinant Protein Production Core](#) provides Northwestern investigators and those outside the campus community low-cost, high-quality controlled recombinant proteins for cutting-edge research projects. The core operates based on two distinct models: a **training model**, where investigators use specialized bioreactor systems and participate in hands-on-training activities, and a **production model**, in which staff carry out the expression and purification of recombinant or synthetic biologics. The core aims to transform research at Northwestern and strives to be user-friendly; the core has parallel bioreactor systems to perform multiplexed lab-scale cultivation of microbial, insect and mammalian cells.

Key services include:

- Transfection/Transformation
- Analytical (small scale) expression in E.coli and mammalian cells
- Protein expression in E. coli (large scale)
- Protein expression in mammalian cell systems (large scale)
- Protein expression in insect cell systems
- Generation of [mouse hybridoma](#), producing monoclonal antibodies, per one fusion
- Rescuing and cultivating eukaryotic cells
- Downstream processing of grown culture (before protein purification)
- Recombinant protein purification
- Tag cleavage with TEV protease
- Large scale monoclonal antibody production
- DNA plasmid propagation and purification
- SDS-polyacrylamide gel electrophoresis analysis
- [Western blot analysis](#)
- Instrument time sharing
- Technical/Instrument assistance time
- Protein recovering from inclusion bodies

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