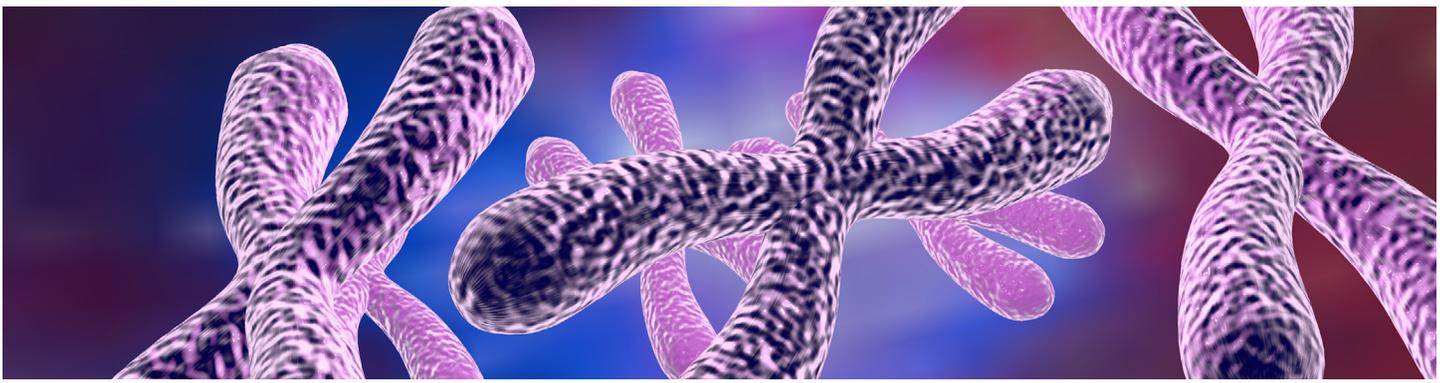


# Breakthroughs

Feinberg School of Medicine Research Office

April 2021



## Sex Differences in Preclinical Science

By Will Doss

Until 1993, women of childbearing age were largely excluded from drug trials. After several high-profile prescription drugs were withdrawn from the market when it was discovered they posed adverse risks to women, the biomedical field faced a reckoning on sex as a biological variable.

Including women in clinical trials has been largely successful, but two decades later — despite efforts from scientists, prestigious journals and funders such as the National Institutes of Health — comprehensive integration of sex differences into preclinical science still lags, according to [Barbara Stranger, PhD](#), associate professor of [Pharmacology](#).



“It’s not enough just to include female animal models or participants in the study,” said Stranger, who is also a member of the [Center for Genetic Medicine](#) and of the [Robert H. Lurie Comprehensive Cancer Center](#) of Northwestern University. “We also need to test if the trait we are studying has an observable difference between males and females, only then does this really inform about biological sex differences.”

Stranger is among a group of Northwestern Medicine scientists who aim to change that, with recommendations for how

individuals and the broader field can better incorporate sex differences or study of female subjects into their research.

### Missing Out

In 2001, the Institute of Medicine (IOM) of the National Academy of Sciences published a report concluding that “Sex matters” and “Being male or female is an important basic human variable that should be considered when designing and analyzing studies.” However, it wasn’t until 2016 that the National Institutes of Health mandated sex be included as a biological variable in preclinical experiments.

Even so, including a few female subjects is not enough to draw rigorous conclusions. Further, in studies with a large population of female subjects, investigators too often fail to test for sex differences, Stranger said. The single biggest piece of advice Stranger gives is simple: split your data. It can be as rudimentary as adding a sex column into a results spreadsheet, but examining these two groups for statistical differences in whatever variables are being tested should be standard practice.

“The basic, first-step principles are unbelievably simple,” Stranger said.

Stranger said that many biological phenomena are ripe for sex-based analysis, but any condition where there is a phenotype difference between sexes is a great place to start. Many autoimmune disorders fit this description, in addition to cancer and dementias.

One area where sex difference have proven difficult to break through is genetics. Stranger, who is a geneticist by trade, acknowledges that teasing apart the contribution of sex

**Exploring Sex in Preclinical Research** *(continued from cover page)*

chromosomes can be a challenge because it requires specific knowledge of the unique features of these chromosomes.

“There’s not the same analytic framework to deal with sex chromosomes as there are for autosomes,” Stranger said. “It’s this complex mosaic, so if you don’t have the expertise it can feel over your head.”

To combat this, Stranger and collaborators wrote a comprehensive methods paper describing best practices for considering sex as a biological variable in genetic studies, to be published later in 2021. The paper describes important considerations for investigating the genetic effect of sex on complex traits, including several analytical methods implemented in the software package [XWAS](#).

“More than anything, I want people to think about sex differences in research as an opportunity, not as a penalty,” Stranger said.

**Sex-specific research**

Some investigators at Feinberg are developing experimental platforms to better study female organisms, including [Julie Kim, PhD](#), the Susy Y. Hung Research Professor. Kim examines the molecular mechanisms of female sex hormones and how they contribute to conditions such as endometrial cancer and uterine fibroids.



Estrogen generally drives cell proliferation. In the endometrium — the inner lining of the uterus — progesterone helps regulate estrogen and prevent rampant cell growth.

Endometrial cancer is highly associated with so-called “unopposed estrogen,” but in tumors that originate in the muscle layer of the uterus, called leiomyoma, progesterone promotes growth. This variability, along with context-dependent actions of sex hormones, means that examining single cell types in the dish can give an incomplete picture, Kim said.

“Studying one cell type at a time gives us a very limited view of

how biology works and makes it hard to be translational,” said Kim, who is also a professor of [Obstetrics and Gynecology](#) in the Division of [Reproductive Science in Medicine](#), co-director of the [Center for Reproductive Sciences](#) and a member of the Lurie Cancer Center.

To combat this, Kim developed a dual cell type endometrial organoid, comprised of both endometrial epithelial and stromal cells. Using a mold to culture the organoids, the two cell types self-assembled, and Kim and her colleagues found this model effectively recapitulated the glandular epithelium and stromal fibroblasts of native tissue, [publishing](#) their findings in *The Journal of Clinical Endocrinology and Metabolism*.

Currently, Kim said she is using this model to study why obesity is highly associated with endometrial cancer, a phenomenon whose biological mechanisms are still not well understood. In addition, Kim and her team have developed and are currently testing a research-friendly microfluidic platform that provides dynamic interactions of up to eight different organ systems. This concept, referred to as “organs on a chip,” allows scientists to conduct experiments targeting several different tissue types at once, which could be especially useful in studying sex hormones, according to Kim.

“One of the goals in my lab is to develop the tools and model systems to best mimic the complexity of sex hormone action in a controlled manner,” Kim said.

**Broader issues**

Individual investigators can certainly make a difference, but sustained and systemic change will only follow from major institutions, according to [Nicole Woitowich, PhD](#), research assistant professor of [Medical Social Sciences](#). The NIH mandate is a good start, but supporting enough female organisms to make meaningful analyses comes at a considerable cost.



“If the NIH is asking us to do this, there should be additional funding mechanisms that support this type of research,” Woitowich said.

While some prominent journals such as the JAMA Network journals require authors to describe sex differences in preclinical studies, how closely editors and reviewers hew to this requirement is an open question, according to Woitowich. These issues are major contributors to a lack of meaningful analysis of sex differences since the NIH mandate, according to a study Woitowich [published](#) in *eLife*.

“We have to get everybody else on board too, because as we can see, funders alone are not getting the job done,” Woitowich said. “We’re leaving information on the table.”

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# Feinberg Rises to 15th in 2022 U.S. News Ranking

Northwestern University Feinberg School of Medicine has been recognized as one of the best research-oriented medical schools in the nation, rising three spots to rank an all-time high of 15th, according to the latest *U.S. News & World Report* [rankings](#), released in March.



This is the 14th year in a row Feinberg has placed in the top 20 of research-oriented medical schools, and several departments ranked highly among the specialty-specific rankings.

“This year’s ranking recognizes the outstanding accomplishments of our world-class faculty and their commitment to transforming the future of medicine,” said [Eric G. Neilson, MD](#), vice president for Medical Affairs and Lewis Landsberg Dean. “Our academic medical center is inspired by research that informs education and patient care through the dedication of our faculty, students, trainees and staff who push the boundaries of scientific discovery. That our rise in the ranks of top institutions comes during a time of unprecedented challenges is a testament to the commitment and drive of our entire community.”

This year, five of Feinberg’s specialty programs were also recognized among the best in the nation. Obstetrics and Gynecology rose five spots to be ranked fourth, surgery rose

12 spots to be ranked 12th, pediatrics rose three spots to 13th, internal medicine rose one spot to 14th, and radiology remained ranked at 17th. Physical therapy, assessed every four years by *U.S. News*, ranked fourth in the nation in 2020. In the *U.S. News* [rankings of public health programs](#), Feinberg’s public health program was ranked 24th, the second-highest ranking for a U.S. public health program that is part of a medical school.

The newly published *U.S. News* research rankings are based on federal expenditures, survey assessments completed by deans and senior faculty at peer institutions and entering class data. The magazine surveyed the nation’s 155 medical schools and 36 schools of osteopathic medicine. Again this year, *U.S. News* significantly altered the rankings’ methodology. In particular, the prior use of NIH Award Dollars and NIH Award Dollars per Faculty was changed from the previous year’s methodology to Federal Grant and Contract Expenditures and Federal Grant and Contract Expenditures per Faculty.

Feinberg, founded in 1859, has built a national reputation for excellence through its leading-edge scientific initiatives, premier clinical facilities and innovative curriculum. The medical school is a critical component of Northwestern Medicine, a top-tier academic medical center, and currently includes 2,032 regular faculty who teach, conduct research and/or practice medicine. During the 2020-2021 academic year, Feinberg welcomed 657 medical students, 1,224 residents and fellows, 401 PhD students, 454 postdoctoral fellows, and 736 master’s and professional program students.

## Seventy-Five Years of Partnership

This year, Northwestern and medical schools across the country are marking [75 years of partnership](#) with the Veterans Health Administration [Veterans Health Administration](#) (VA).

To celebrate this long-standing affiliation, the medical school has published a website: [75 Years of VA Partnership](#). The site includes a timeline of Northwestern’s relationship with the VA, research highlights, links to the VA’s web stories, videos and press release about the celebration, and an opportunity to learn more about the forward-thinking Paul Magnuson, MD. Magnuson, the chair of the Department of Bone and Joint Surgery at Northwestern in 1946, developed an innovative plan to help returning World War II veterans: Staff VA hospitals with medical school faculty and resident trainees.



*Northwestern’s relationship with the VA has spanned many years and multiple venues. Shown here: the VA Lakeside Medical Center on the Chicago campus in the 1960s, which was later demolished.*

# Graduate Student/Post-Doc Events and Opportunities

## Northwestern Medical Orchestra | 2021 Virtual Spring Concert

Friday, April 30  
Time: 7:00 p.m. to 9:00 p.m.  
Online via Zoom

Join the Northwestern Medical Orchestra (NMO) for an evening of livestreamed chamber music performances, including pieces by Piazzolla, Mozart, Brahms, Mendelssohn and much more. NMO musicians include alumni, physicians, medical students, staff and other members of the Northwestern community.

[Register here](#)

**Contact: Jillian Brubaker, [jillian.brubaker@northwestern.edu](mailto:jillian.brubaker@northwestern.edu)**

## Drop-In Meditation: The Practice of Loving-Kindness

Friday, April 23, 30 and May 7  
Time: 12:15 p.m. to 12:45 p.m.  
Online via [Zoom](#)

During the first six weeks of spring quarter, there will be a focus on the cultivation of loving-kindness as a practice of meditation to help regain our sense of self-worth and to extend a heartfelt sense of compassion, care and safety to all beings.

## Barre Group Exercise

Monday, April 26, May 3, 10, 17 and 24  
Time: 5:30 p.m. to 6:00 p.m. CST  
Online via Zoom

Barre is a fusion of yoga, Pilates and strength training that is aimed at lengthening and strengthening the muscles. Please review the [Virtual Group Exercise Online Consent](#) before participating in any virtual classes.

[Register here](#)

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

**Northwestern Recreation, [recreation@northwestern.edu](mailto:recreation@northwestern.edu)**

## Spring 2021 Remote Wellness Coaching

Wellness Coaching helps you identify and achieve your wellness goals, balance dimensions of wellness and learn practical skills to improve overall well-being.

Coaches can address goals related to:

- Physical activity
- Sleep
- Healthy eating
- Time management
- Stress management/coping skills

**Learn more: register on the [Wellness at Northwestern website](#).  
Health Promotions & Wellness, [hpaw@northwestern.edu](mailto:hpaw@northwestern.edu)**

## Research in the News

### **Associated Press, March 6**

[More Infectious COVID-19 Variant Identified in Chicago](#)  
Egon Ozer, MD, PhD, was featured.

- This research was also featured in *U.S. News & World Report* and *Chicago Tribune*.

### **NBC News, March 6**

[Bisexual Women With Straight Male Partners Least Likely To Be Out, Study Finds](#)  
Casey Xavier Hall, PhD, MPH, was featured.

### **U.S. News & World Report, March 11**

[Opioid Deaths Spiked in Chicago's Home County While a Stay-at-Home Order Was in Effect](#)  
Maryann Mason, PhD, was featured.

### **CNBC, March 12**

[Why Slack Can Actually Make You Less Productive, and Three Things That Might Help](#)  
Jennie Lin, MD, MTR, was featured.

### **Crain's Chicago Business, March 12**

[Northwestern Develops Drug That Can Kill Brain Tumor Cells](#)  
Priya Kumthekar, MD, was featured.

### **HealthDay, March 22**

[Breakfast Timing Could Affect Your Odds for Diabetes](#)  
Kristen Knutson, PhD, was featured.

- This research was also featured in *U.S. News & World Report*, ABC 7 and NBC News.

### **WebMD, March 23**

[Neurologic Symptoms Frequent in COVID Long-Haulers](#)  
Igor Koralnik, MD, was featured.

- This research was also featured on Fox News and ABC News.

### **WTTW News, March 31**

[Northwestern Study Says 1994-2004 Federal Assault Weapons Ban Worked](#)  
Lori Ann Post, PhD, was featured.

- This research was also featured on Fox 32.

[More media coverage](#)

# Uncovering How Neural Mechanisms Shape Behavior Control

Ann Kennedy, PhD, Assistant Professor of Physiology



[Ann Kennedy, PhD](#), is an assistant professor of [Physiology](#). She is a theoretical neuroscientist who uses dynamical systems, statistical modeling and machine learning to study the structure of animal behavior and the neural mechanisms of behavior control. The goal of her research is to develop new theories and models to better understand how neural structure controls function and shapes behavior across the animal kingdom, as well as to improve the understanding of how neural circuit function is altered in various neurological disorders.

## Q&A

### What are your research interests?

We're interested in how different parts of the brain interact to shape our behavior, and how the structure of neural networks is related to their computational function. Our lab develops machine learning tools for automated tracking and analysis of animal behavior and builds models to relate that behavior to activity in the brain. We collaborate with labs recording from brain areas involved in behavior and motor control, including the hypothalamus, basal ganglia, cerebellum and motor cortex, to help them identify structure in their high-dimensional neural recordings and determine how that structure relates to what those brain areas are computing.

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

Behavioral control is a massively distributed thing — hundreds of thousands of neurons across dozens of interconnected brain areas all contribute their own small piece to steering us through the day. Our brains form representations of our motivations — to eat, interact, escape predators — and somehow are able to balance all of these competing drives in a way that is robust and highly flexible. We want to understand what computational principles these massive, distributed networks are applying that allow them to be so successful. We also hope that by better understanding the computational mechanisms at work in these circuits, we'll be able to shed light onto how their function is altered in neurological disorders such as autism, PTSD and Parkinson's.

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

I learned to write code at a young age (my mother was an assembly coder who developed operating systems back in the 70s) and I've always been interested in the question of what makes certain problems easy for us but hard for computers. During my PhD, I studied how the structure of the neural microcircuit in the cerebellum determines how that system can learn and how learning generalizes. From there, I pursued a postdoc with Dr. David Anderson's group at Caltech to study the control of more naturalistic, innate behaviors by nuclei of the hypothalamus. While we have a decent handle on the basic computational principles at work in the cerebellum, making sense of bigger structures, like the densely interconnected nuclei of hypothalamus, is much tougher. Technologies for recording from behaving brains have evolved a lot in the past decade, which means now there is a tremendous demand for models and theoretical frameworks that can incorporate this new kind of data.

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

Collaboration is very important to our group, and we work broadly with experimental labs to study complex behavior and its control by the brain. At Northwestern, we are collaborating now with the labs of [Jim Surmeier](#), [Jones Parker](#), and [Greg Schwartz](#) to develop improved computer vision systems for automated tracking and behavior recognition in mice. We are also working with [Lee Miller](#) to study the structure of complex motor behaviors. Beyond Northwestern, one new project I'm excited about is a team effort with Drs. Weizhe Hong, Zoe Donaldson, Michael Yartsev, Peyman Golshani and Daniel Aharoni to study the formation and structure of social memories across different species, including mice, prairie voles and Egyptian fruit bats.

### How is your research funded?

We are currently funded by NIH grants, including a National Institute of Mental Health Pathway to Independence (K99/R00) award and a U01 from the National Institute of Neurological Disorders and Stroke. Our research is also supported by startup funds from Feinberg's Department of [Physiology](#).

### Where has your work been published?

Our lab is still getting off the ground, but towards the end of my postdoc I published papers in [Nature](#), [Nature Neuroscience](#), [Neuron](#) and through the CVPR machine learning conference.

# Virology: Studying the "Edge of Life"

Daniel Giraldo Perez, sixth-year student, Driskill Graduate Program in Life Sciences



Daniel Giraldo Perez, a sixth-year student in the Driskill Graduate Program in Life Sciences (DGP), studies the innate immune response to the herpes simplex virus in the brain. Working in the laboratory of [Richard Longnecker, PhD](#), the Dan and Bertha Spear Research Professor and a professor of [Microbiology-Immunology](#), Giraldo Perez studies differences between newborn and adult brains that cause differing outcomes in HSV infection.

## Q&A

### Where is your hometown?

I am originally from Bogotá, Colombia. Bogotá is in the middle of the Andes, so it is surrounded by mountains. When I say I am from Colombia, people always assume I come from a tropical place — but because the altitude is around 8,500 feet, the average temperature is around 55 to 60 degrees Fahrenheit.

### What are your research interests?

I have always been passionate about science and have explored many different fields. An enduring interest in biology led me to virology, which is the subject of my dissertation. I find viruses fascinating because they are always challenging what we think is true in biology. They have very small genomes compared to most other organisms, but they are incredibly efficient in encoding all the necessary information they need to completely reprogram and take over a cell.

### What exciting projects are you working on?

As a graduate student in the Longnecker laboratory, I study the innate immune response to herpes simplex virus (HSV) in the brain. HSV establishes a life-long infection in the brain but it is mostly asymptomatic in adults. However, when newborns become infected, they often exhibit sores, fever and sometimes even death. I am interested in studying specific differences in the immune response in the brain that can account for these very different outcomes.

My first paper, [published](#) in the journal *mBio*, examined how different proteins are found at different levels in the newborn brain compared to the adult. We also experimented with a treatment to increase expression of certain proteins that can provide protection from infection in models of HSV infection. I am currently studying how different cell types in the brain contribute to this immune response. We know neurons are not very good at this, so we are interested in studying how other supporting cells in the brain provide protection against HSV.

### What attracted you to your program?

I decided to attend the DGP because it was an umbrella program that would allow me to explore many different interests without

necessarily committing to one specific field of research. I also liked that the program was directly connected to Feinberg. I was interested in performing translational research, which is precisely the focus of most labs here. We also have a very strong microbiology department, so I was interested in joining one of the many labs doing virology research. One fun fact is that my initials are also "DGP."

### What has been your best experience at Feinberg?

I would say being a part of the Kids-Inspired Innovation for Careers in Science (KIICS) led by [Patrick Seed](#) definitely stands out to me. The goal of this program is to give PhD students exposure to clinical care and I had the opportunity to shadow the pediatric Infectious Diseases team at Lurie Children's Hospital during their rounds, attend grand rounds lectures and have regular meetings with MDs to discuss clinical trials. This was a unique opportunity because I was able to see the human side of all the diseases that I regularly hear about during research talks.

I have also been heavily involved with the DGP student council and have led our mentoring program for incoming students for the past few years. This has definitely been a very gratifying experience and gave me the opportunity to connect with most of the DGP student body.

### How would you describe the faculty at Feinberg?

In my experience, faculty at Feinberg have always been very supportive and invested in the training of their students. They are all very passionate about science and are pushing each other to do the best science they can.

### What do you do in your free time?

I have picked up a few hobbies during my time in graduate school. I took up running during my second year. I really enjoy running on the lakefront trail when the weather permits and try to run a couple of half marathons each year. I was lucky enough to get a spot for the Chicago Marathon in 2018. Recently, I have picked up rock climbing and try to do that a couple of times a week, which has been the perfect activity for winter. Before the pandemic, I also used to go to a lot of film festivals at the Gene Siskel Film Center or the Music Box Theatre. After moving to Chicago, I also developed a taste for beer and like to explore all the different breweries the city has to offer.

But by far, my favorite activity is volleyball. Anyone who knows me, knows that I try to play 3-4 times a week. I mostly enjoy indoor volleyball but try to go out to beach as much as I can during summer. I spent most of my free time last summer playing grass volleyball at different parks all around Chicago when everything else was closed because of the pandemic.

### What are your plans for after graduation?

As I am nearing graduation, I am exploring many different career paths. I want to be able to use my scientific expertise outside of academia to help solve some of the most pressing issues we are facing right now. I am examining different options in the biopharmaceutical industry and in life science consulting.

# Award-Winning Management at IPHAM

Juleen Morford, manager of research administration at the Institute for Public Health and Medicine



Juleen Morford, manager of research administration at the Institute for Public Health and Medicine (IPHAM), oversees and manages nearly every aspect of award administration for the research institute.

## Q&A

### Where are you originally from?

I am originally from Alpena, Michigan, a place my dad likes to say “no one goes to by accident.” It’s a small town with industrial roots on the shores of Lake Huron. Its claims to fame are the annual Brown Trout Festival, the Thunder Bay National Marine Sanctuary and the fact that you have to drive for over an hour to find a Starbucks.

### What is your educational background?

My education has focused on international and intercultural studies. I completed a bachelor’s in anthropology and African studies from Kalamazoo College, a Master of Arts in intercultural studies from Lesley University, and a Master of Education in international education development from Teachers College at Columbia University. I loved all of it, but as with so many research administrators, none of it prepared me directly to work in this field!

### What is your professional background?

I’ve been working in higher education for 20 years, and I’ve always worked to support members of the academic community — students, scholars and faculty — by demystifying federal regulations and university processes so they can focus on their academic pursuits.

I spent the first 10 years of my career helping international students and scholars navigate the F-1 and J-1 visa regulations at schools in Boston and New York. When I moved to Chicago 10 years ago, I started working at Northwestern first at Kellogg as a program manager in Executive Education. While I enjoyed the work and the intellectual environment, I wanted to find a position that used a wider range of my skills and interests. I chose to move into research administration since it seemed to fit the bill and provided a path for career progression that can be difficult to find in higher education roles. I started as an associate research administrator at the McCormick School of Engineering and after two years moved to IPHAM where I’ve been for the last five years and am now a manager on a wonderfully dynamic and successful team.

I’m very happy that I chose to work in research administration. There is always something new to learn, new ways to engage with the field and the research administration community, and my work supports the innovative and collaborative research of IPHAM investigators.

### Why do you enjoy working at Northwestern?

Northwestern is made up of amazing people. I’ve benefited immensely from a great group of colleagues and mentors in my career here. I also appreciate that NU has created so many programs to support employee well-being and development both within Feinberg and at the university level.

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

From proposal submission through award closeout, I focus on the administrative details so investigators can focus on their science. When an investigator has an idea for a proposal, I review the funding announcement, create a timeline for preparing the documents for submission and alert them to any special requirements needed for the submission. I especially enjoy working with early-career investigators — students, postdocs and junior faculty — as they launch their research careers. Submitting a proposal is no small endeavor, and I’m happy to work with and support them through the process.

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

I enjoy a good puzzle, so I like when I need to dig into a project and try to untangle the threads. I’ve always been motivated to support individuals with their personal and professional growth through my work so I enjoy working with the training and education grants throughout the different centers in IPHAM. I’ve learned over the years that I have the most job satisfaction when I’m supporting research to which I feel a personal connection, so having the opportunity to work with these types of grants and the trainees is meaningful to me. There is fascinating and important research in all of our centers and I’ve enjoyed working with them all but I find the most fulfillment in supporting these types of awards.

### What exciting projects are you working on?

I’ve recently had the opportunity to become more engaged with supporting research administration in the broader Feinberg and university communities. I am currently working with a group of administrators from across the university to develop a resource for post-award administration of institutional National Research Service Awards. I’m excited to collaborate with colleagues across the university to develop an impactful resource that will hopefully make the process of managing these types of awards less stressful and help trainees and departments maximize the value of these important training awards.

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

In my spare time, I enjoy reading, hiking in the forest preserves, dabbling in new classes (Chinese, painting, woodworking, salsa dancing — you name it, I’ll try it) and playing Wild Kratts with my son (he’s Chris; I’m Martin).

# NIH News

## New Extramural Nexus Site and Subscription Options

Extramural Nexus email subscription options and website have been refreshed to improve readability and browsing experience.

A new email subscription service has been added to make it easier to receive updates on topics impacting the extramural research community. Any subscriptions you already have for the monthly Extramural Nexus newsletter will continue. You have the option to [subscribe](#) to real-time notifications – choose between notifications for every post (including *Open Mike*) or just the *Open Mike* blog posts. To ensure you receive communications for Extramural Nexus, add [nih.extramural@subscriptions.nih.gov](mailto:.nih.extramural@subscriptions.nih.gov).

You will also find a new and improved [Extramural Nexus](#) website, your source for news on grants policies, processes and more. The redesigned site contains the same content you rely on, only now with a modern look and improved browsing capabilities. You can easily browse by categories like ‘New Resources’ and ‘Tips Before You Submit’ in the main menu.

## The Impact of the COVID-19 Pandemic on the Extramural Scientific Workforce – Outcomes From an NIH-Led Survey

NIH recognizes the many ways the COVID-19 pandemic could adversely affect the biomedical workforce, particularly members of underrepresented groups and vulnerable populations. In October 2020, NIH fielded [two online surveys](#) to objectively document COVID-19’s impact on extramural research. One survey assessed the perspective of individual research administration leaders at extramural institutions, and the other survey assessed the perspective of the investigators themselves. A high-level overview of general trends noted within both surveys is noted in [this Open Mike](#) blog post by NIH Deputy Director Michael Laurer, MD, and Deputy Director of the National Institute on Aging, Marie Bernard, MD.

## Continued Extension of Policy Flexibilities for Basic Experimental Studies Involving Humans (BESH)

NIH has [extended flexibilities for registration and results reporting](#) for studies submitted to BESH funding opportunities. This policy flexibility, originally announced in [NOT-OD-18-212](#) and [NOT-OD-19-126](#), is now extended through September 24, 2023. While BESH investigators are strongly encouraged to register their studies and report summary results to [ClinicalTrials.gov](https://clinicaltrials.gov), NIH is continuing to offer the flexibility for investigators to register and report results on alternative publicly available platforms at this time. It is important to note that this flexibility only applies to studies submitted through funding opportunities that are designated as “Basic Experimental Studies with Humans” in the title. For more information, refer to [NOT-OD-21-088](#).

## NUCATS Corner

Clinical and Translational Sciences Institute



## Apply for Social Media Consultation Pilot Program

The NUCATS Institute and Institute for Sexual and Gender Minority Health and Wellbeing (ISGMH) have partnered to launch a pilot consultation program for research study teams interested in using social media for online participant recruitment. The NUCATS Institute’s Center for Clinical Research and ISGMH’s Center for Translational Health Research and Interventions Advancing Equity for Sexual and Gender Minorities have years of experience recruiting diverse populations from social media networks including, but not limited to, Facebook, Instagram, Twitter, Google and Reddit.

Research teams enrolled in the pilot will receive an initial one-hour consultation with feedback and guidance on current or new campaign materials, management tips, suggestions for alternate social media platforms, methods to track rates of success, suggestions to increase exposure and ways to optimize a study team’s budget. To apply for participation in this pilot program, please complete the [Social Media Consultation Intake Form](#).

## EQuaTR Registration Open

The 2021 Enhancing Quality in the Translational Research Workforce Conference will be held virtually over a four-week period in May and June. [Register today](#).

This conference is open to professionals in clinical and translational research including clinical research coordinators, research nurses, monitors, project and site managers, investigators, regulatory staff, research assistants, and allied health professionals. The conference offers the opportunity to gain additional knowledge on current trends and issues in clinical research for application in their professional setting.

This year’s conference will take place on Thursdays:

- May 13, 11 a.m. to 1:15 p.m.
- May 20, 27 & June 3, 10 a.m. to 12:15 p.m.

# Sponsored Research

**PI: Matthew Feinstein, MD, assistant professor of Medicine in the Division of Cardiology and director of the [Clinical and Translational Immunocardiology Program](#)**

**Sponsor: National Heart, Lung, and Blood Institute**

**Title: Immunologic, Inflammatory, and Clinical contributors to HIV-Related Heart Failure with Preserved Ejection Fraction (HFpEF)**

Our goal is to determine clinical, immunologic and inflammatory factors that lead to heart failure with preserved ejection fraction (HFpEF) for people with human immunodeficiency virus (HIV), with the clinically relevant goal of improving HFpEF screening, prevention and therapy for people with HIV (PWH).

In general, inflammation and immune dysfunction are important precipitants of HFpEF and may be particularly important for HIV-associated HFpEF. However, data are limited regarding HFpEF clinical risk factors and pathophysiology in PWH.

Our central hypothesis is that PWH with incomplete immune recovery, as indicated by lower CD4 counts and CD4/CD8 ratios, are especially susceptible to HFpEF in the presence of “second hits” ranging from hypertension to specific ART classes associated with off-target comorbidities (such as weight gain).

In the first aim, we will investigate clinical risk factors and interactions thereof that are most strongly associated with incident HFpEF for PWH. In the second aim, we seek to more deeply understand the biology of HIV-associated HFpEF and will therefore leverage a multi-marker proteomics panel – for which we have extensive pilot data in non-HIV HFpEF patients – to define immunologic and inflammatory contributors to HFpEF for PWH. In Aim 3, we will use a novel method to determine, at a single-cell level, meaningful differences in immune cell gene expression that may lead to systemic biomarker abnormalities and HFpEF for PWH; we will validate these findings in cardiac tissue in Aim 4.

[Read more](#)



**PI: Jindan Yu, MD, PhD, professor of Medicine in the Division of [Hematology and Oncology](#) and of [Biochemistry and Molecular Genetics](#)**

**Sponsor: National Cancer Institute**

**Title: Comprehensive analyses of HOXB13-regulated transcriptional programs critical for prostate cancer progression**

Prostate cancer (PCa) is the most commonly diagnosed non-skin cancer in American men. Early-stage PCa can be effectively ablated with surgery and/or radiation treatments. However, metastatic PCa remains a challenge, and the standard treatment is androgen-deprivation therapy (ADT). However, a majority of PCa patients develop resistance to ADT over a period of months to years, ultimately resulting in castration-resistant PCa (CRPC) and widespread aggressive tumors.

The mechanisms for this resistance are not fully understood, but it has been shown that aggressive PCa tumors accumulate lipid droplets for fueling metastatic progression. Thus, a key to overcoming ADT is to identify the driver genes of tumor metastasis, such as lipogenesis genes, which may be promising targets for therapeutic intervention and a long-term cure.

In preliminary studies, we found that HOXB13, a prostate-specific homeodomain-containing transcription factor, is down-regulated in CRPC as compared to primary PCa, and we found a previously uncharacterized role of HOXB13 in transcriptional repression of lipogenesis. We identify a novel HOXB13-interacting protein, the histone deacetylase 3 (HDAC3), which closes target chromatin for gene repression.

Of note, this interaction is disrupted by HOXB13 G84E mutation that has been reported in familial PCa and associated with early-onset PCa. Moreover, our data showed that HDAC3-regulated genes remarkably overlapped with HOXB13-regulated genes. Like HOXB13, HDAC3 inhibits lipogenic genes, such as fatty acid synthase (FASN), and this is accompanied by the removal of acetylation on key histones at target genes.

Hence, our central hypothesis is that HOXB13 recruits HDAC3 to repress lipogenic gene expression through epigenetic remodeling and that FASN inhibitors will be effective in treating CRPC with low or G84E-mutant HOXB13.

[Read more](#)



# Funding

## Interdisciplinary Research Leaders (IRL)

[More information](#)

**Sponsor: Robert Wood Johnson Foundation**

**Application Deadline: May 5**

**Amount: \$200K**

**Synopsis:** The broad goal of this program is to produce diverse interdisciplinary leaders who conduct and apply high quality, community-engaged, action-oriented, equity-focused health research in order to drive improvements in the health of communities. This opportunity seeks teams of researchers and community members who are committed to working together to produce community-relevant, action-oriented research to improve health and wellbeing.

The program will recruit and select applicant organizations represented by teams of three people: two mid-career researchers and one community member to become IRL program fellows. IRL teams will join together as a diverse cohort of fellows that will participate in a three-year program.

## Transformative Nucleic Acid Sequencing Technology Innovation and Early Development (R01 Clinical Trial not Allowed)

[More information](#)

**Sponsor: National Human Genome Research Institute (NHGRI)**

**Letter of Intent: May 26**

**Application Deadline: June 25**

**Upper Amount: 700K per year with a maximum project period of four years**

**Synopsis:** The NHGRI solicits applications to innovate and develop the early stages of novel technologies that will enable greater than a one order of magnitude improvement

in 1) DNA sequencing and 2) methods for direct sequencing of the diversity of entire RNA molecules. Advances in genomics and more broadly in biomedical research have been greatly facilitated by cycles of technology innovation and disruption that have driven significant and sustained nucleic acid sequencing throughput and assembly quality increases combined with cost decreases and read quality improvements. The goal is to dramatically advance DNA sequencing and direct RNA sequencing technologies at reasonable costs with the anticipation that significant innovation in any of these and related areas would make significant contributions to the mission of NHGRI and the field of genomics, including contributions to many of NHGRI's other technology development goals.

## Mechanisms of HIV Resistance to Broadly Neutralizing Antibodies (bNAbs) (U01 Clinical Trial Not Allowed)

[More information](#)

**Sponsor: National Institute of Allergy and Infectious Diseases (NIAID)**

**Letter of Intent Due: June 30**

**Application Deadline: July 30**

**Award Information:** NIAID intends to commit \$2.5M in fiscal year 2022 to fund 2-3 awards; the maximum project period is five years and is determined by the scope of the proposed project.

**Synopsis:** This funding opportunity announcement encourages multidisciplinary teams to characterize mechanisms that impact resistance to HIV broadly neutralizing antibodies (bNAbs) and develop strategies to prevent and overcome HIV resistance to bNAbs.

[View COVID-19 funding opportunities](#)

[View more funding opportunities](#)

## Welcome New Faculty

[Rui Yi, PhD](#), joins as the Paul E. Steiner Research Professor of [Pathology](#) and of [Dermatology](#). His team studies mechanisms that govern epithelial cell fate specification, stem cell maintenance and aging. They use single-cell genomics and computational tools, live animal imaging and genetically engineered mouse models to study gene expression regulation at the single-cell resolution in mammalian skin. Their studies have provided key insights into hair follicle stem cell activation and hair loss. At Northwestern, his team will develop new diagnostic and therapeutic approaches to treat human skin diseases. Yi was previously a professor in the Department of Molecular, Cellular, and Developmental Biology at University of Colorado, Boulder. He earned his PhD at Duke University.



# Library Support for Grant Projects, Impact Statements, and More



**By: Eileen Wafford, Research Librarian**

Libraries have moved beyond being places to simply check out books or devices and study for exams to institutions that address topics spanning the information lifecycle. Galter Health Sciences Library and Learning Center offers a range of specialized services that include:

[Classes and workshops](#)

[Support for systematic and scoping reviews](#)

[Metrics and Impact Core](#)

[Publication support](#)

[Clinical Informationist Service](#)

[Data Clinic](#)

These services are possible due to the diversity of skills, knowledge and experience of the [staff at Galter](#). Many teams have partnered with Galter staff to add information resources and specialized services to advance patient care, research and education at Feinberg School of Medicine. We highlight a few of these collaborations here.

## **Library-School-Community Partnerships**

Since 2016, Galter has partnered with faculty and staff at Feinberg and Northwestern Memorial Hospital to provide students in the Northwestern Medicine Scholars Program at Westinghouse College Prep with hands-on training on how to [locate, access and appraise](#) sources of health information using basic and advanced searching techniques. Librarians have also contributed to the Evidence-Based Practice training for the undergraduate and post-baccalaureate students from Northeastern Illinois University, University of Illinois at Chicago, Northwestern University, City Colleges of Chicago and other community colleges in the Chicagoland area who participate in the ChicagoCHEC Summer Research Fellows Program. These students leave the library sessions with a greater understanding of different [sources of health information](#) and studies to support their research projects.

## **Strengthening Grant Applications and Projects**

Various teams have leveraged expertise at Galter by embedding library staff into grant applications. Galter

joined the Outreach Services Department at St. Charles Public Library on a grant from the Network of the National Library of Medicine that allowed a Galter librarian to participate in [senior health outreach programs](#) and teach seniors to navigate and evaluate online sources of health information. Galter Library joined the [Health for All – Real Talk: Clinical Trials project](#), led by [Melissa Simon, MD, MPH](#), to bring librarian and informatics expertise to a [project](#) that addresses health disparities through increasing research literacy and participation for underrepresented populations. A recent collaboration with [Susanna McColley, MD](#), and a team of collaborators from multiple Clinical and Translational Science Awards hubs involves a Galter librarian working with the group to develop comprehensive searches. The literature generated by the searches will help support a [Synergy paper](#) on improving representation in medical research through structural changes.

## **Metrics and Impact Support**

Liaison librarians and members of Galter's Metrics and Impact Core team offer an annual review of [NIH biosketches](#). This review is meant to confirm appropriate form use, formatting and possible creation of metrics statements that can be used to describe research outputs. The Metrics and Impact Core team can also generate two different reports to assist groups in their grant submission. The Funding Support Impact Statements report includes useful text to describe a group's topical expertise, citation, impact and possible comparison of performance with other academic institutions. This report can be paired with the Funding Support Bibliometric Networks report, which includes two bibliometric networks: Co-Author Network to highlight collaborations with key members of the group and a Term Co-occurrence Network to highlight topical expertise within the group. An overview statement is provided for each network.

The partnerships between library and research teams at Feinberg present a unique opportunity to share knowledge and resources to advance project goals. To learn more about collaborating with Galter librarians on a project, [contact us](#) for a consult.

# High-Impact Factor Research

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(continued on next page)

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## Featured Core

### Outcomes Measurement and Survey Core

The Outcomes Measurement and Survey Core (OMSC) provides consultation and support for cancer investigators within the [Robert H. Lurie Comprehensive Cancer Center of Northwestern University](#) through collecting, analyzing or interpreting self-report data in culturally diverse populations.

The OMSC, located within the Department of [Medical Social Sciences](#), provides expertise on measuring outcomes derived by self-report; serves as a central resource for state-of-the-science instruments and measurement methods; and provides in-house research support services for translation, collection and analysis of outcomes and survey data.

Key services include:

#### Research Design Consultation Services

- Assistance with development of new protocols
- Questionnaire/Survey selection and development
- Recruitment strategies and assessment plans
- Analysis methods

#### Programming & Analysis Services

- Computer-based questionnaire administration tools
- Scoring algorithms
- Psychometric and statistical analysis and interpretation

#### Research Operations Services

- Training for study interviewers
- Multilingual study interviewers
- Multilingual translations of questionnaires and surveys
- Qualitative methods (focus groups, cognitive interviewing)

**Contact:** [OMSC@northwestern.edu](mailto:OMSC@northwestern.edu)

**Location:** 625 N. Michigan Ave. 22<sup>nd</sup> Floor

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