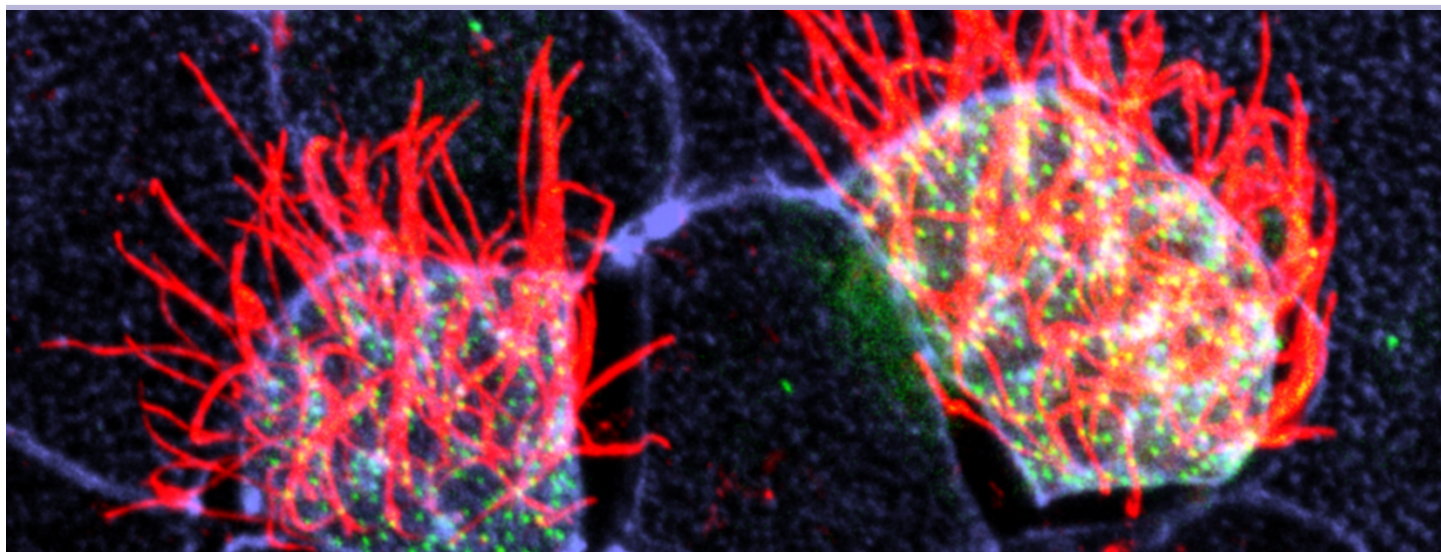


# Breakthroughs

Feinberg School of Medicine Research Office

December 2018



*Ciliated cells on the surface of frog embryos, with cilia highlighted in red. From research published in March by Brian Mitchell, PhD.*

## Celebrating Our 2018 Discoveries

By Anna Williams

The medley of Feinberg research published in 2018 exemplifies what has been a banner year for discovery at the medical school. From fundamental new understandings of the cell published in *Nature* to landmark clinical trials in the *New England Journal of Medicine* and cross-disciplinary collaborations in *Science Translational Medicine*, investigators throughout our institution have advanced new knowledge that is already transforming their diverse fields.

In the 2017-2018 fiscal year, Feinberg principal investigators secured more than \$484 million in sponsored research awards, a total that formed the majority of Northwestern University's [record-breaking year](#) for research funding. In particular, Feinberg's growth reflects a 13 percent increase in funding from the National Institutes of Health.

In the final issue of *Breakthroughs* for 2018, we're taking a look back at a few of the exciting research stories that marked the past year at Feinberg.

"The high-impact discoveries made by Feinberg investigators this year reflect the continued growth of our extraordinary research enterprise. The publications we are highlighting here represent just a small sampling of the substantial contributions our faculty members led across a range of scientific disciplines in 2018," said [Rex Chisholm, PhD](#), vice dean for Scientific Affairs and Graduate Education. "As we look ahead to 2019 and the opening of the new Simpson Querrey Biomedical Research Center, I anticipate another year of groundbreaking research."

### January: Scientists Identify Direct Contact Between Mitochondria and Lysosomes

Northwestern Medicine scientists kicked off the year with a rare fundamental discovery about cell function, [published](#) in *Nature*. A team led by [Dimitri Krainc, MD, PhD](#), the Aaron Montgomery Ward Professor and chair of the Ken and Ruth Davee Department of [Neurology](#), discovered for the first time that two key cellular structures, mitochondria and lysosomes, come into direct contact with each other to regulate their respective functions. "It's a surprising finding that provides new insights into normal cell function and will likely have implications for a number of diseases across the board," Krainc said.

**2018 Discoveries** *(continued from cover page)***February: Quality Toolkit Improves Care in Indian Hospitals**

[Mark Huffman, MD, MPH](#), the Quentin D. Young Professor of Health Policy, associate professor of [Preventive Medicine](#) and of [Medicine](#) in the Division of [Cardiology](#), was first author of a study that found a simple toolkit of checklists, education materials and feedback reporting improved the quality of care, but not outcomes of major cardiovascular events, in a group of 60 hospitals in south India. The findings were [published](#) in *JAMA*.

**March: Key Polarity Protein Uncovered**

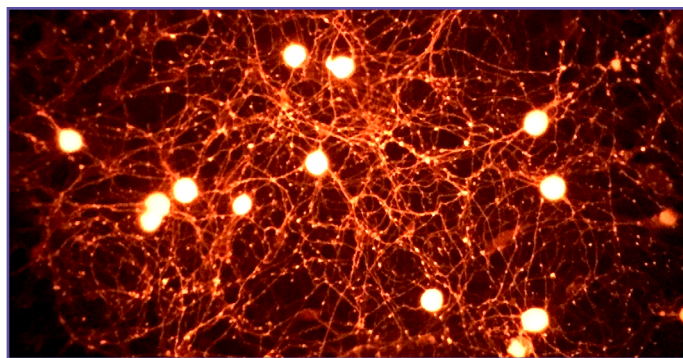
A team led by [Brian Mitchell, PhD](#), associate professor of [Cell and Molecular Biology](#), identified a protein called CLAMP to be crucial to planar cell polarity — a mechanism that organizes cells and allows some to perform specialized functions. The study, [published](#) in the *Journal of Cell Biology*, has important implications for the understanding of early development and certain diseases, including respiratory conditions.

**April: Molecule May Be Key to Pain Relief in Diabetic Neuropathy**

Painful diabetic neuropathy (PDN) is an incurable nerve disease that affects about one-quarter of all patients with diabetes. [Daniela Menichella, MD, PhD](#), assistant professor of Neurology in the Division of [Neuromuscular Diseases](#), demonstrated that blocking a molecule called CXCR4 reversed pain and nerve degeneration in laboratory models of PDN. The discovery, [published](#) in the *Journal of Clinical Investigation*, may lead to the first ever disease-modifying therapy for patients with PDN.

**May: Resetting the Epigenetic Balance for Cancer Therapy**

The laboratory of [Ali Shilatifard, PhD](#), chair of [Biochemistry and Molecular Genetics](#) and director of the [Simpson Querrey Center for Epigenetics](#), delivered a remarkable number of high-impact discoveries this year, including a paper [published](#) in *Nature*



*In vitro cultured nociceptive neurons genetically labeled in red and ready for analysis of their intracellular calcium concentration using Fura-2 in vitro calcium imaging. From research published in April by Daniela Menichella, MD, PhD.*

*Medicine*. The study identified an epigenetic imbalance that silences the expression of tumor-suppressing proteins, allowing cancerous cells to proliferate. The scientists further demonstrated that a molecular inhibitor reverses the imbalance and inhibits tumor growth in a lab model. “This is a simple molecular concept with major clinical significance,” Shilatifard said.

**June: Men With Aggressive Prostate Cancer May Get New Powerful Drug Option**

[Maha Hussain, MD](#), the Genevieve Teuton Professor of Medicine and deputy director of the [Robert H. Lurie Comprehensive Cancer Center of Northwestern University](#), was the senior author of a large clinical trial that may lead to a new treatment option for men with aggressive prostate cancer. The findings, [published](#) in the *New England Journal of Medicine*, showed that an existing drug called enzalutamide significantly lowered the risk of metastasis or death for men with non-metastatic castrate-resistant prostate cancer and a rising PSA level.

**July: Smoke-Free Policies Linked to Lower Heart Disease Risk**

Laws that ban smoking at workplaces and other public places are associated with a significantly lower risk of cardiovascular disease — even after controlling for a variety of factors — found [Kiarri Kershaw, PhD, MPH](#), assistant professor of Preventive Medicine in the Division of [Epidemiology](#), in a study [published](#) in *Circulation*. Smoke-free policies in workplaces were associated with a nearly 50 percent reduction in risk among middle-aged adults, while policies for bars and restaurants were linked to a reduction of around 25 percent.

**August: Induced Labor at 39 Weeks Reduces Need for Cesarean Birth**

For many years, obstetricians counseled women that inducing labor increased the likelihood of a cesarean birth. But findings from a large national study led by [William Grobman, MD, MBA](#), the Arthur Hale Curtis, MD, Professor of [Obstetrics and Gynecology](#), reversed that commonly-held belief: The clinical trial showed that electively inducing labor at 39 weeks actually reduces the rate of cesarean deliveries and decreases maternal

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# Women's Health Research Institute Names Co-Director

For the past decade, the Women's Health Research Institute ([WHRI](#)) has served as a catalyst for sex- and gender-inclusive basic science and clinical research at Northwestern University. Founded in 2007 by [Teresa Woodruff, '89 PhD](#), the WHRI has provided education and support for research that explores the influences of sex and gender on health and disease.

Focusing on the next decade, with plans to bring the same educational resources provided to the Northwestern Medicine community, Woodruff has tapped cardiologist [Marla Mendelson, MD, '87 GME](#), to serve as the institute's co-director.

Mendelson has been an outstanding champion for women's health at Northwestern, having served as the founder and director of the Program for Women's Cardiovascular Health within the Bluhm Cardiovascular Institute and through her commitment to the care of women in a field that has been wrought with sex- and gender-bias. She serves as a role model and mentor to trainees and early-career physicians and is committed to advancing the next generation of leaders in science and medicine.

Mendelson served as a founding member of the WHRI Scientific and Medical Leadership Council, composed of an interprofessional group of scientists, clinicians and other allied health professionals who set the strategic priorities for the institute. According to Woodruff, Mendelson was a natural choice for the role. "I am delighted to welcome Marla Mendelson as co-director of the WHRI — our motto is *Science to Care* and that is now reflected perfectly in our leadership," said Woodruff.



"We have incredible resources here at Northwestern for women's health and I am honored to be asked to help advance the mission of the WHRI," shared Mendelson. "Having been involved with the WHRI since its inception, I am inspired by the achievements to date and with the potential for growth into the clinical arena."

## 2018 Discoveries (continued from page 2)

and fetal complications. The findings were [published](#) in the *New England Journal of Medicine*.

### September: [Simple Blood Test Reveals Body's Internal Clock](#)

The first simple blood test to identify a person's precise internal time clock as compared to the external time was developed by a team of Northwestern Medicine scientists, including [Rosemary Braun, PhD, MPH](#), assistant professor of Preventive Medicine in the Division of [Biostatistics](#), and [Phyllis Zee, MD, PhD](#), chief of [Sleep Medicine](#) in the Ken & Ruth Davee Department of Neurology. The new test, [described](#) in the journal *PNAS*, will for the first time offer scientists the opportunity to easily examine the impact of misaligned circadian clocks in a range of diseases, from heart disease to diabetes and Alzheimer's disease.

### October: [Inherited Genetic Variants Associated With Bleeding on Common Anticoagulant](#)

[Minoli Perera, PharmD, PhD](#), associate professor of [Pharmacology](#), was senior author of a study that found a group of gene mutations seen only in African-Americans and people of African ancestry may contribute to an increased

risk of serious bleeding while taking warfarin, a common anticoagulant drug. "These mutations could be included in the risk-benefit calculations every physician makes with a patient," Perera said. The research was [published](#) in *JAMA*.

### November: [Skin Sensor Could Improve Life for a Million Hydrocephalus Patients](#)

A collaboration between clinicians and biomedical engineers led to the development of a new wireless, Band-Aid-like sensor that could revolutionize the way patients manage hydrocephalus — a potentially life-threatening condition in which excess fluid builds up in the brain. [John Rogers, PhD](#), professor of [Neurological Surgery](#) and at the [McCormick School of Engineering](#), and [Matthew Potts, MD](#), assistant professor of Neurological Surgery, were co-senior authors of the study [published](#) in *Science Translational Medicine*. "It's a wearable device with a specific but useful mode of operation that's addressing an unmet need in clinical medicine," Rogers said.

**December:** Check out the [Feinberg News Center](#) to follow new research stories throughout December.

# Clearing Your Throat: Investigating Swallowing Disorders

John Pandolfino, MD, Chief of Gastroenterology and Hepatology  
and the Hans Popper Professor



Though the esophagus is a vertical tube that connects the mouth and stomach, food doesn't simply fall down the tube, propelled by gravity. Instead, the esophagus is lined with powerful muscles that pump food to the stomach with waves of rhythmic contractions.

[John Pandolfino, MD, '94 '96 '01 GME](#), chief of [Gastroenterology and Hepatology](#) in the Department of [Medicine](#), has spent much of his career investigating the pipes and valves of the esophagus — a natural fit for somebody who comes from a family of plumbers. "It's probably in my blood," he said.

However, anatomical mechanisms are just one of a triad of factors that can affect swallowing; brain-gut interactions and psychological stressors can also contribute to swallowing disorders. These cross-disciplinary causes have led Pandolfino to reach across institutional lines, collaborating with faculty in a range of departments at Feinberg and the McCormick School of Engineering.

## Q&A

### What are your research interests?

My research interests focus on bolus transport through the esophagus as it pertains to swallowing issues, inflammation of the esophageal wall and gastroesophageal reflux. The core components of the work center around an interplay between clinical observation and developing physiologic and biomechanical models to explain those observations.

This translational science allows us to better phenotype patients and develop relevant biomarkers and targets to improve function and reduce symptoms. This work also requires an understanding of the brain-gut interaction that drives symptom severity, so understanding the role that psychological stressors and central nervous system modulation play in this relationship is a crucial part of our model and research program.

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

We have two specific aims. The first focuses on using physiology, principles of biomechanics, mathematical modeling and in-silico simulations to define normal and abnormal esophageal function. This requires expertise in engineering, physiology and clinical research, and our ultimate goal is to develop new tools to better understand esophageal diseases and to develop better biomarkers of disease severity and discover new targets for therapy. This part of our research requires collaboration with engineers and experts in tissue material properties at the McCormick School of Engineering, basic scientists focused on inflammation and fibrosis, and skilled data scientists.

Our second aim focuses on symptom expression of these abnormalities in bolus transport and how we can better quantify the severity and brain-gut interactions that modulate this output. This component requires collaboration with psychologists and experts in psychometrics, as well as clinicians focused on specific esophageal diseases, such as eosinophilic esophagitis, achalasia, scleroderma esophagus and gastroesophageal reflux disease. Our ultimate goal is to develop a universal model that connects the molecular perturbations that lead to abnormal esophageal bolus transport and describe how these mechanical changes lead to symptoms and reduced quality of life. We theorize that mathematical and in-silico models developed in our lab can be used to define better treatments and personalize the approach to these heterogeneous disorders.

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

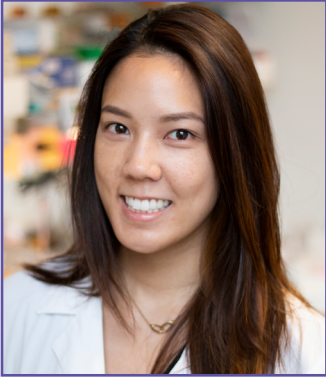
I became interested in this work during my gastroenterology fellowship when I had the opportunity to work with my mentor, [Peter Kahrilas, MD, '84 GME](#), here at Northwestern. Peter combined astute clinical observation with an in-depth understanding of physiology to explain disease pathogenesis. This form of research was very exciting because it had immediate impacts on patient outcomes. We were able to describe markers of severity in GERD that could be targeted for therapy. Over the years I extended this model to dysphagia and developed strong collaborations with my engineering colleagues, Neelesh Patankar, PhD, and Walter Kou, PhD, to incorporate in-silico models to better understand the "plumbing" of the esophagus.

I have also been fascinated by what drives symptom severity as I realized early on that even if I fixed the plumbing, some patients would not get better. Since then, I've worked with my colleagues in psychology to better understand how stress and anxiety can modify symptoms and how cognitive flexibility and function alter how the patient interacts with that symptom.

(continued on page 9)

# Investigating Synaptic Dysfunction in Parkinson's Disease

Maria Nguyen, Northwestern University Interdepartmental Neuroscience Program



Maria Nguyen, a fifth-year student in the Northwestern University Interdepartmental Neuroscience Program (NUIN), studies the genetics of Parkinson's disease in the laboratory of [Dimitri Krainc, MD](#), chair of [Neurology](#).

## Q&A

### Where is your hometown?

I was born and raised in the beautiful Pacific Northwest city of Portland, Oregon, also known as the City of Roses.

### What are your research interests?

Being involved in scientific research early on in college really opened my eyes to the neurological disease plaguing my own family. Because of this, I am fascinated with the genetic study of diseases and the idea that one single DNA change can drastically affect someone's life. I am also intrigued by how the position of the DNA change can determine what disease one will get, whether that disease will happen early on or late in life or whether one will be protected against certain diseases in the future. I am very fortunate to have had the opportunity to work in the laboratory of Dr. Krainc, where I have been able to study the genetics of Parkinson's disease for the past five years.

### What exciting projects are you working on?

I have several projects currently keeping me busy. The first is my main thesis project, which focuses on the consequences of synaptic dysfunction in Parkinson's disease (PD). Previously, both mitochondrial and lysosomal dysfunction had been implicated in disease pathogenesis, but recent genetic discoveries are hinting towards the importance of synaptic dysfunction in PD. My work shows how two PD genes, LRRK2 and auxilin, associate with one another to mediate synaptic dysfunction in disease. The field has been trying to figure out an answer to the million-dollar question, "Why do dopaminergic neurons degenerate in Parkinson's disease?" While there is no one direct answer, I think that every day we are getting closer to solving this complex question, and it has been a pleasure to take part in this process.

My second project is giving me a small taste of what industry will be like. Our lab has identified an important druggable target for the treatment of PD, and I am now working closely with a medicinal chemist to generate compounds that I can then test in PD-affected human-derived neurons. This experience has taught me how to design and carry out experiments that give robust phenotypes and reproducible data. This skill and rigor will definitely be useful to me as I continue on in my scientific career.

### What attracted you to the PhD program?

When I was initially applying for PhD programs I didn't know where I wanted to end up, let alone what disease I wanted to study. All I was sure of was that I wanted to live in a big city and to research the brain. Those two requirements attracted me to the Windy City and to NUIN. After my interview weekend, I felt that the NUIN family really cared about me as an individual and my personal motivations for pursuing neuroscience research. To them, I wasn't just another qualified applicant on paper but one that could really fit into the community here. Because of this experience, I ultimately decided to call Chicago home.

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

The best experience has just been the joy of connecting with so many talented individuals from different backgrounds and cultures. These conversations have all helped me grow both personally and professionally.

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

I would describe the faculty as one big family. Everyone plays an important role and each individual has their own unique set of experiences that they can bring to the table. Because of this, I think the department runs quite smoothly, and I am always confident that someone is there and willing to help me with my needs.

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

In my free time, I enjoy talking to my lab members about anything but science. It sounds trivial but when you're constantly thinking about science, these conversations are like a breath of fresh air. In addition, I also like to read, cook and workout by myself, as well as pamper myself with at home spa treatments. I find that time spent alone can be both relaxing and rejuvenating.

Chicago is also a great city that is known for its music, food, art and history. In my free time, I find myself being a tour guide for friends and family who visit. Even after five years of living in the city, I can still count on Chi-town to give me new and memorable experiences.

### What are your plans for after graduation?

I guess my short-term plans would be to secure a job and move to the East Coast. I would like to work in industry and build my business experience there. I am really interested in how bench science can be translated into life-saving treatments for patients. In order to do this, I believe that the best environment would be to work and network among biotech individuals who have the same mission in mind.

If my plans don't work out, I hope to just be happy and thankful at whatever point I am in life.

Connect with Maria on [LinkedIn](#).



# Helping Scientists Develop Commercialization Strategies

Nick Maull, JD, MBA, Associate Director for New Ventures, Northwestern University Clinical and Translational Science Institute (NUCATS), and Innovation and New Ventures Office (INVO)



## Q&A

### Where are you originally from?

Cincinnati, Ohio, born and raised! I moved to Chicago in 2011.

### What is your educational background?

I graduated from Miami University in Oxford, Ohio, with a bachelor's in biology and neuroscience. Following

undergrad, I earned a JD at the University of Cincinnati College of Law with concentrations in business and intellectual property law. In 2017, I earned a master's in business administration from Northwestern University Kellogg School of Management.

### Please tell us about your professional background.

I have a pretty diverse background. I started my career doing research at Cincinnati Children's Hospital Research Foundation in the developmental biology and genetics department. I also worked with my faculty PI to develop a startup out of our lab that created antibodies as research tools. I began law school in 2008 and clerked for law firms and the tech commercialization office at Cincinnati Children's Hospital Research Foundation, which piqued my interest in working with startups.

After law school, I worked in a law firm's litigation groups for about a year in Cincinnati. I moved to Chicago at the end of 2011 and received an offer from Northwestern to join the legal team at the Innovation and New Ventures Office (INVO). I started managing a patent portfolio and assisting INVO personnel with various business transactions, including licensing and partnerships. I eventually found myself working heavily with startups and took on a dual role within NUCATS and INVO. I began managing a proof of concept fund for developing early stage innovations, as well as the Chicago Innovation Mentors program, which was developed to mentor early stage startups.

### Why do you enjoy working at Northwestern?

I love the team at Northwestern and after meeting [Alicia Löffler, PhD](#), associate provost for [Innovation and New Ventures](#), I believed in her vision and plan to grow INVO. This all started about seven years ago when I was one of the first people she brought in. I also knew I was going to get the opportunity to grow and get exposure to projects and experience that many do not receive right out of law school.

One of the coolest things I have done during my tenure at

Northwestern was launch a venture capital fund to invest in Northwestern startups. It was a great experience and afforded me the opportunity to work with many high-level stakeholders at Northwestern. I currently manage Northwestern's venture capital funds, [N.XT](#) and NUSeeds. We invest in promising early stage companies developed at Northwestern. Our mission is impact, so we really strive to help companies that we believe can make a significant impact in any market, and ultimately society. We have currently made 11 investments to date in various technologies, from cancer therapeutics to battery storage technologies.

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

I help scientists develop commercialization strategies and counsel talented entrepreneurs and innovators on business issues regarding their startups. I also invest in promising technologies developed by faculty and students to help accelerate those technologies to market. We work with startups at every stage of early development, from product development, to intellectual property procurement and management, to business planning and financing.

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

I love my job, and feel lucky to have the opportunity to do what I do. I get to work for and with an amazing and talented group of people, and I learn something new every day. I spend my days researching new innovations that are developed by our faculty, and then help faculty develop strategies for commercializing those innovations.

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

I am an obsessive golfer and have been playing since I was 3 years old. I also love to travel with my wife, and spend as much time as I can outdoors in nature. I love to ski, fly fish and backpack through national parks all over the world. I am also obsessed with innovation; I am constantly reading about new ideas and technologies. I am interested in technologies that solve real problems, and I think that too often as technology accelerates at an exponential rate, most innovations just solve problems that previous innovations created for ourselves just a few years earlier, or current innovations simply entertain us. I love technologies that improve our well-being individually and as a society.

### Anything else we should know about you?

I recently married my beautiful wife, Laurie, in Cabo San Lucas, Mexico!

Connect with Nick on [LinkedIn](#).

# Research in the News

## National Public Radio, October 31

[For Cervical Cancer Patients, Less Invasive Surgery Is Worse For Survival](#)

Masha Kocherginsky, PhD, and Emma Barber, MD, were quoted.

► This research was also featured in *CBS News*, *Yahoo News* and *USA Today*.

## Reuters, November 6

[Benefit of Low-Salt Diet for Heart Failure Uncertain](#)

Clyde Yancy, MD, was quoted.

## American Heart Association, November 8

[AHA: Traumatic Childhood Could Increase Heart Disease Risk in Adulthood](#)

Jacob Pierce, MD/MPH candidate, was quoted.

► This research was also featured in *HealthDay*.

## Associated Press, November 11

[Heart Meeting Features Fish Oil, Vitamin D, Cholesterol News](#)

Donald Lloyd-Jones, MD, ScM, was quoted.

► This research was also featured in *The New York Times*, *U.S. News & World Report*, *The Wall Street Journal* and others.

## HealthDay, November 12

[Nearly 1 in 12 U.S. Kids Has a Food Allergy](#)

Ruchi Gupta, MD, was quoted.

► This research was also featured in *The Wall Street Journal*, *NBC News*, *HealthDay*, *WebMD* and *U.S. News & World Report*.

## U.S. News & World Report, November 15

[Like Coffee? You May Be Genetically Wired That Way](#)

Marylin Cornelis, PhD, was quoted.

► This research was also featured in *National Public Radio*, *Chicago Tribune*, *HealthDay*, *WebMD* and *U.S. News & World Report*.

## The Wall Street Journal, November 20

[The Benefit of Facial Exercises](#)

Murad Alam, MD, was quoted.

[More media coverage available online.](#)

Northwestern University

# NUCATS

Clinical and Translational Sciences Institute



## NUCATS Corner

### Preparing an NIH Grant?

NUCATS offers services and resources to support and enhance your grant submission. Investigators in the planning stages of a new program or center grant are encouraged to request a NUCATS [Studio Consultation](#). These consultations bring together leadership from NUCATS and our clinical partners to identify relevant resources and help you and your team leverage existing NUCATS infrastructure in order to be more competitive for federal funding. Example services and resources include:

- [Resources & Environment boilerplate language](#): an editable compendium of resources and services provided by NUCATS, our clinical partners and Northwestern University research cores and units
- [ACT Network](#): a real-time platform for multi-site cohort discovery allowing researchers to explore and validate feasibility for clinical studies across many of the Clinical and Translational Science Award hubs around the country
- [SMART IRB](#): a platform designed to ease common challenges associated with single IRB support
- [Trial Innovation Network](#): a collaborative initiative offering resources to support study design, recruitment, data coordination and other initiatives for multi-site clinical trials

Learn more about these and other support services [here](#) and connect with a NUCATS Navigator [here](#).

## Latest Podcast Episodes

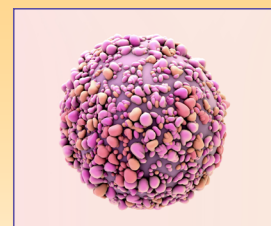
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**The Genetics of Coffee Drinkers with Marilyn Cornelis, PhD. Listen [here](#).**



**Precision Medicine for African-Americans with Minoli Perera, PharmD, PhD. Listen [here](#).**



**Improving Survival for Advanced Breast Cancer with Massimo Cristofanilli, MD. Listen [here](#).**

# Sponsored Research



**PI: Steven DeVries, professor of Ophthalmology and Physiology**

**Sponsor: National Eye Institute**

**Title: Function of Basal Synapses at Mammalian Photoreceptors**

The goal of this project is to understand how the unique structure of the mammalian cone photoreceptor synapse determines its function in vision. Parallel processing in the visual system begins at the cone synapse. After glutamate is released from the cone, it must diffuse over an extracellular path of 200 to 500 nm to reach the dendrites of basally contacting bipolar cells. Recent results suggest that a long diffusion path can introduce a threshold that eliminates the low-amplitude noise associated with random fluctuations in cone transmitter release in the dark. At the same time, the threshold permits the cone to transmit signals resulting from larger release events coordinated by a change in illumination.

Using electro- and opto-physiological techniques, DeVries' project will address mechanisms that increase the threshold nonlinearity at basal contacts. The work may have implications for understanding how the signaling capacity of the cone synapse, and hence vision, can be degraded by diseases of the outer retina such as retinitis pigmentosa and macular degeneration.

[Read more about this project.](#)



**PIs: Richard Gershon, PhD, vice chair for research in the Department of Medical Social Sciences and professor of Medical Social Sciences and Preventive Medicine; David Condon, '14 PhD, assistant professor of Medical Social Sciences**

**Sponsor: National Institute on Aging**

**Title: The Mobile Toolbox for Monitoring Cognitive Function**

The prevalence of dementia due to Alzheimer's disease and related disorders increases with advancing age. However, the ability to disambiguate cognitive decline due to typical aging from the earliest stages of these diseases is challenging. In part, we are hampered by a lack of sensitive assessment tools across the adult

lifespan that can be easily and widely deployed within diverse research settings and populations.

Gershon, Condon and a large team of investigators at Northwestern and eight other institutions will address this limitation by developing, validating, norming and disseminating an app-based validated cognitive assessment tool called MobileToolbox that can be administered remotely via a smartphone in adults aged 20 to 85. Once developed and validated, the assessments within the MobileToolbox Research Platform can be used in treatment trials and ultimately within the clinical environment to treat and prevent Alzheimer's Disease.

[Read more about this project.](#)

## Welcome New Faculty



Colleen Peyton, DPT, joins us as assistant professor of Physical Therapy and Human Movement Sciences and Pediatrics. Her research focuses on understanding the role white matter plays in the motor performance of high-risk preterm infants. Peyton earned her doctorate in physical therapy from the MGH Institute of Health Professionals in Boston and completed a pediatric physical therapy fellowship at the Shirley Ryan AbilityLab, formerly the Rehabilitation Institute of Chicago. She has published numerous peer-reviewed papers and is currently principal investigator on a project using a smartphone app to detect neurodevelopmental outcomes in high-risk infants. In addition to her academic and research accomplishments, Peyton has earned many awards for her clinical work, including Outstanding PT Clinician of the Year from the American Physical Therapy Association.



**Pandolfino***(continued from page 4)*

[Laurie Keefer Levine, PhD](#), and [Tiffany Taft, PsyD](#), were very generous in helping me better understand these interactions and eventually became very important collaborators. These interactions have made me a much better scientist and also changed the way I practice medicine.

Lastly, I have developed a new-found interest in the molecular underpinnings of why the esophageal wall loses its ability to accommodate and propel a bolus, and new collaborations with basic scientists, like [Marie-Pier Tetreault, PhD](#), have taught me how these fundamental cellular changes can be linked and explained by our current models. This is the best part of my job as I constantly get to learn and incorporate new ideas to improve my work.

**How is your research funded?**

Fortunately, our work has been funded by many sources. The National Institutes of Health has been a major supporter of our work, and we currently have a new P01 grant funding three unique projects and two specific cores focused on bio-physiologic modeling and tissue material properties within the grant.

Additionally, the Digestive Health Foundation (DHF) has provided much-needed infrastructure to support a biorepository and the components that allow us to connect tissue and blood to state-of-the-art physiologic models and psychometrics. The DHF has also funded multiple pilot studies that support some of the hypotheses of the P01, and this has been a great platform for young investigators.

**What resources at Northwestern have been helpful?**

Feinberg has been a major resource and provided funds to further augment the work of the P01 and the cores that we developed for that application. The Department of Medicine was equally supportive and also helped in our ability to recruit junior faculty and support trainees involved in our research. Of course, Northwestern University Clinical and Translational Sciences Institute ([NUCATS](#)) and the Biostatistics Collaboration Center ([BCC](#)) were crucial for the success of our grant and our current work. NUCATS provided a unique opportunity to present our proposal to a panel of experts and their input was crucial in modifying our proposal and organizing our admin core. The BCC has been a standard component of our work as we have relied on their team for proposal preparation and ongoing data analysis.

# Funding

**Long-acting Drug Delivery Systems for ART Optimization in HIV-1 Infected Children**[More information](#)**Sponsors:** National Institute of Allergy and Infectious Diseases**Letter of Intent Due:** February 13**Submission Deadline:** March 13**Amount:** \$640,000–\$860,000 in direct costs per year for a maximum of five years

**Synopsis:** Awards will support the accelerated development of safe and effective long-acting drug delivery systems (LA-DDS) for the improved and simplified treatment of HIV-1 in children. Applicants engaged in the development of existing LA-DDS at early product development stages are encouraged to apply. The funding opportunity is an exploratory and developmental award that will consist of phased research activities with investigator-provided milestones. Industry partnership and collaboration is required.

**Diabetes Research Centers (limited submission)**[More information](#)**Sponsor:** National Institute of Diabetes and Digestive and Kidney Diseases**Submission Deadline:** January 14 (internal proposal due)**Amount:** \$1M in direct costs per year with a maximum period of five years

**Synopsis:** This grant seeks to support and enhance the national research effort in diabetes by developing new therapies to improve the health of Americans with, or at risk for, diabetes and other endocrine and metabolic-related disorders. All internal proposals should be sent to Eric Boberg at [e-boberg@northwestern.edu](mailto:e-boberg@northwestern.edu) as only one application per institution will be considered.

**Telomeres in Wellness and Disease: A Biobehavioral Approach**[More information](#)**Sponsor:** National Institute of Nursing Research**Submission Deadline:** Standard dates apply (February 16 first due date)**Upper Amount:** \$275,000 over a maximum of two years

**Synopsis:** Research has demonstrated telomeres contribute to health-related outcomes but further research is needed to maximize telomere-guided approaches. The purpose of this grant to stimulate clinical research examining the role of telomeres in wellness and disease, and advance the incorporation of telomere studies in biobehavioral programs.

[View more funding opportunities](#)

# Core Library Support Series for Northwestern Medicine Investigators

By Linda C. O'Dwyer, head of research & information services

Galter Health Sciences Library & Learning Center strives to bring you resources, services and innovations to meet your research needs. Maybe you use our website to access journals and don't know much about what else we can offer you as a researcher. Read on to learn more about some of our core services for the Northwestern Medicine research community.

## Systematic Review Services

So you want to write a systematic review. Where do you start? How many databases should you search? How do you come up with different search strategies in unfamiliar databases? What tools should you use to screen the articles? What's a systematic review protocol? What are PRISMA guidelines? If you have questions like this, we recommend you check out our [Systematic Review guide](#) and consult with a librarian at the outset of your project.

## NIH Biosketches

Having issues coming up with your contributions to science or adapting to the latest Biosketch format? We have a [comprehensive guide](#) for that! Librarians can also give you tips on how to jazz up your biosketch with publication and citation counts.

## NIH Public Access Compliance

Did you know that Pamela Shaw, our bioinformatics librarian is also the NIH Public Access Policy Compliance Monitor Role for Northwestern University? Pamela supports researchers and their staff with issues regarding compliance with the NIH Public Access Policy. These issues include:

- Managing publications with MyNCBI's "My Bibliography"
- Depositing papers to PubMed Central through the NIH Manuscript Submission system
- Dealing with journal publishers to request deposit of manuscripts to PubMed Central or NIHMS
- Formatting biosketches in accordance with the NIH new biosketch format and using the MyNCBI SciENcv biosketch tool

Check out our [NIH Public Access Policy guide](#) and feel free to [reach out to Pamela](#) with your public access compliance questions.

## DigitalHub

[DigitalHub](#) provides a portal for making the scholarly output of Northwestern Medicine faculty and scientists publicly available, and it provides a means to track views and downloads. The repository can accommodate all of your scholarly products, such as published or unpublished research papers, conference presentations, educational materials, case reports and technical reports, open access books, datasets and more.



DigitalHub offers users several key benefits, including: a persistent, citable identifier (DOI), metrics for deposited items, management of licensing with a wide range of rights statements and enhanced discoverability with machine-readable metadata. The goals of DigitalHub are to preserve intellectual works created by the Northwestern Medicine scholarly community, to enhance the visibility of Northwestern Medicine scholarship and to promote its authors by enabling discovery and accessibility of these works by the international scientific community.

Examples of items that the repository can host include:

- Research papers, published or unpublished
- Conference papers and presentations (including lectures)
- Educational materials
- Case reports, technical reports
- Supporting multimedia images
- Posters
- Open access books
- Datasets

## Research Impact

The [Metrics and Impact Core](#), housed in Galter Library, has expertise in bibliometrics, data visualization, continuous improvement, information systems and [alternative metrics](#) to help you understand and communicate your own research impact. The core provides extensive advisory services for researchers, groups or departments on topics such as:

- developing successful publishing strategies
- managing or tracking publications
- maintaining an impactful online identity
- measuring or assessing research impact by discipline
- communicating research impact to audiences

The Galter Library is ready to help you bring your research to the next level! Start with [your liaison librarian](#) and we'll figure out the right tool or person for the job.

# High-Impact Factor Research

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The Feinberg Research Office regularly tracks research published by Feinberg investigators. The citations are used on web pages, in newsletters and social media, for internal reporting and more. To more accurately track these journals, the Research Office asks that Feinberg investigators use the following institution name in the address field when publishing in peer-reviewed journals: "Northwestern University Feinberg School of Medicine."



# Calendar

TODAY | Tuesday, December 11

## Microbiology-Immunology Seminar

Andrea Sant, PhD, professor of Microbiology and Immunology at University of Rochester Medical Center, will present "The Contributions of CD4 T-cells to Protective Immunity to Influenza Infection." Sant's research is currently focused on the exploration of virus tropism in the lung and the effector function of influenza-specific CD4 t-cells.

**Time:** Noon to 1:00 p.m.

**Location:** Robert H. Lurie Medical Research Center  
Baldwin Auditorium  
303 E. Superior St.

**Contact:** [m-brown@northwestern.edu](mailto:m-brown@northwestern.edu)

[More information](#)

Thursday, December 13

## Lurie Cancer Center Grand Rounds

Guest speaker, Douglas Yee, MD, director of Masonic Cancer Center at the University of Minnesota will present "Did We Learn Anything by Targeting the IGF Receptor in Breast Cancer?"

**Time:** 4:00 p.m. to 5:00 p.m.

**Location:** Robert H. Lurie Medical Research Center  
Gray Conference Room  
303 E. Superior St.

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

[More information](#)

Thursday, January 10

## Mesulam Center Lecture

David Holtzman, MD, will present "Mechanisms in Aging and Dementia (MAD) Training Grant Day." Holtzman is chairman of Neurology and a professor of Developmental Biology at Washington University School of Medicine in St. Louis.

**Time:** Noon to 1:00 p.m.

**Location:** Robert H. Lurie Medical Research Center  
Baldwin Auditorium  
303 E. Superior St.

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

[More information](#)

[More research events here.](#)

# NIH News

## Feinberg Faculty Featured

A clinical trial funded by the National Cancer Institute (NCI) found that patients with brain metastasis that were treated with whole-brain radiation therapy (WBRT) specifically avoiding the hippocampus were less likely to experience declines in cognitive function, when compared to patients that received standard WBRT. Co-investigator Vinai Gondi, MD, director of research at the Northwestern Medicine Proton Center and the Northwestern Medicine Cancer Center Warrenville, recently reported the trial's findings at the annual meetings of the American Society for Radiation Oncology and the Society for Neuro-Oncology. Read more about this research featured on the NCI website [here](#).

## New NIH Fiscal Policies for Grant Awards in Effect

As of September 28, 2018, new fiscal policies were signed into law affecting the following areas:

- Fiscal Year 2019 Funding Levels – Non-competing continuation awards made in FY 2019 will generally be issued at the commitment level indicated on the Notice of Award.
- [Ruth L. Kirschstein National Research Service Awards \(NRSA\)](#) – Increase of NRSA stipends by approximately 2 percent on average
- Next Generation Researchers Initiative Policy – Prioritizes meritorious R01-equivalent applications from early stage investigator principal investigators
- Salary Limits – Salary limit is set at \$189,600

Click [here](#) for details on these updates.

## Multi-Project Application Resources

If you plan on submitting a multi-project and need help navigating the application, you may want to check out [these](#) helpful resources for detailed guidance.

## Follow Feinberg Social Media

