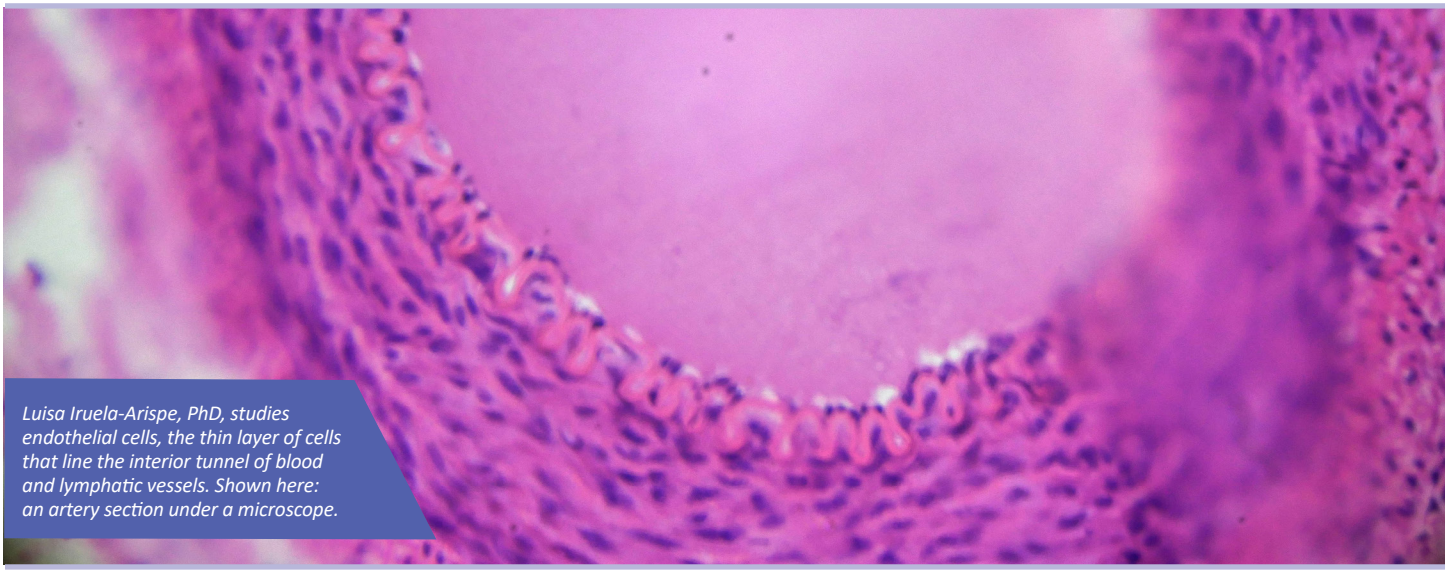
Breakthroughs

Feinberg School of Medicine Research Office

November 2019



Luisa Iruela-Arispe, PhD, studies endothelial cells, the thin layer of cells that line the interior tunnel of blood and lymphatic vessels. Shown here: an artery section under a microscope.

Championing Interconnectivity: The New Chair of the Department of Cell and Developmental Biology

By Will Doss

If the heart is a massive highway interchange, oxygenating blood before pumping it back into the circulatory system, the blood vessels are county roads, surface streets, cul-de-sacs and alleys. Snaking into every organ and system in the body, blood vessels deliver oxygen and nutrients that all tissues depend on, playing an important role in both normal function and disease.

This is enabled by the unique nature of endothelial cells, the thin layer of cells that line the interior tunnel of blood and lymphatic vessels, governing passage of materials through the bloodstream. These cells have an exceptional ability to adjust their number and arrangement to suit the vast array of requirements in all the body's neighborhoods, lying dormant for days or weeks before jumping into action, multiplying to form new capillaries, veins and arteries.

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"I found endothelial cells fascinating from the get-go because of their remarkable adaptability," said Luisa Iruela-Arispe, PhD, the Stephen Walter Ranson Professor and new chair of the Department of Cell and Developmental Biology. "Because endothelial cells and blood vessels are so critical to the function of all organs, they are an active participant in the resolution or worsening of any pathology. They sense and quickly adapt to their environment. Be it changes in levels of oxygen, fluid, shear stress or pathogens, there is always a response tailored to ensure the survival and well-being of the tissue."

Much like the interconnected nature of the vascular system she studies, Iruela-Arispe aims to engender a sense of cross-disciplinary collaboration at the department, bringing together scientists investigating the myriad human cell types and using those findings to treat illness throughout the body.

"Our goal is to house outstanding investigators who are at the cutting edge of cell biology, to resolve long-standing questions and advance therapeutic avenues," Iruela-Arispe said.

Born in Spain and raised in Argentina and Brazil, Iruela-Arispe was initially interested in development biology, completing her doctoral degree at the University of São Paulo in 1989.

(continued on page 2)

Connectivity (continued from cover page)

However, she found her scientific passion drifting from broad developmental questions to endothelial cell biology, and in 1990, she joined the laboratory of Helene Sage, PhD, at the University of Washington in Seattle.

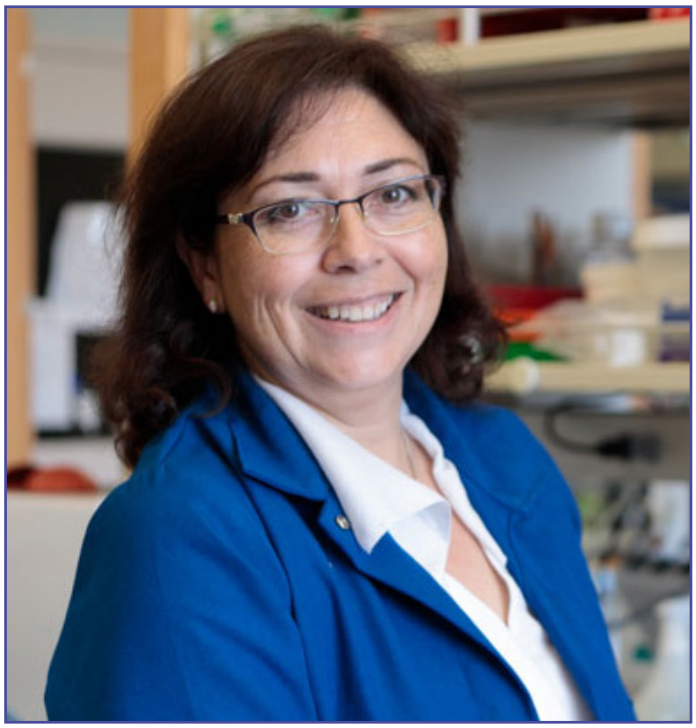
"Studying endothelial cells was like studying development, but these cells can be triggered to re-initiate vascular formation on-demand in adult tissues, rather than just in the womb," Iruela-Arispe said.

She later joined the faculty at Harvard Medical School, and, in 1998, was appointed assistant professor at the at University of California, Los Angeles (UCLA). There, she investigated the molecular mechanisms that regulate blood vessel formation during development and pathogenesis, ultimately becoming the Distinguished Professor of Molecular, Cell and Developmental Biology and director of UCLA's Molecular Biology Institute.

Her interest centered on the cells' ability to organize vascular networks, ready to divide but holding still until they receive an environmental cue that signals for new blood vessel formation. Once that happens, endothelial cells draw on ancestral genetic knowledge, reactivating the same mechanisms used to create the blood vessels in the first place.

"Every time we expand adipose tissue, expand muscular mass or repair wounds, endothelial cells use the same programs that we learned during development," Iruela-Arispe said.

These investigations are pointed toward treating disease — in the vascular system and beyond. While vascular tissue cancers such as angiosarcoma are deadly, they are incredibly rare compared to other cancers. The exceptional ability of endothelial cells to control division may be the reason, and Iruela-Arispe believes learning from this example could improve cancer treatment across the board.



Luisa Iruela-Arispe, PhD, the new chair of Cell and Developmental Biology.

"Studying why endothelial cells have this ability to reboot and yet not be as susceptible to mutations is fascinating," Iruela-Arispe said. "We could apply this knowledge to other cell types and try to use that knowledge to correct programs in other cells."

Other vascular diseases, like peripheral artery disease, atherosclerosis and lung inflammatory disease, are much more common than vascular tissue cancer. While vascular diseases vary widely in cause and symptoms, they all have one thing in common: The disease-causing mechanism is in blood vessels, presenting an opportunity for intervention.

"In the example of lung inflammatory diseases, if you can somehow affect the decision of endothelial cells to enable trafficking of inflammatory cells from the blood into the lung tissue, you could affect the course of that disease," Iruela-Arispe said.

At Northwestern, she wants to focus on a broad base of research, but is especially excited by the prospect of cell-based treatments — modifying individual cells to fight disease, whether that's helping repair damaged cells or attack bad actors.

"We are entering an era where cell biology is impacting clinical practice and therapies," Iruela-Arispe said. "To me, cell and development biology is probably one of the meccas of developing new avenues and strategies to directly effect resolution of disease."

CONTENTS

New Center for Applied Health Research on Aging Launched

By Emily Ayshford

Building on years of research and collaborations dedicated to promoting informed decision-making and engagement for optimal health and well-being among seniors, the Institute for Public Health and Medicine (IPHAM) has launched the Center for Applied Health Research on Aging (CAHRA).

The Center will be directed by Michael Wolf, PhD, MPH '02, associate vice chair for research in the Department of Medicine and professor of Medical Social Sciences. It will unite faculty across disciplines to investigate cognitive, psychosocial, community and health system factors that affect a person's ability to manage their health. Center faculty will also work to design interventions to influence health-related behaviors and outcomes.

The Center will focus on six key research programs:

- Health Literacy & Learning, led by Stacy Cooper Bailey PhD, MPH, associate professor of Medicine in the Division of General Internal Medicine and Geriatrics, which will focus on health literacy promotion and patient engagement;
- Cognitive Aging, led by Laura Curtis, MS, research assistant professor of Medicine in the Division of General Internal Medicine and Geriatrics, which will study how changes in cognitive function influence self-management skills and health behaviors;
- Psychosocial Support, led by Rachel O'Conor, PhD, research assistant professor of Medicine in the Division of General Internal Medicine and Geriatrics, which will examine the role of support networks for patients with complex care needs;
- Life Course Health, led by Marina Arvanitis, MD, MPH, assistant professor of Medicine in the Division of General Internal Medicine and Geriatrics, which will study how skills acquired across the lifespan help inform self-care;
- Treatment Adherence, led by Wolf and Bailey, which will develop and test interventions to improve a person's ability to adhere to treatment recommendations;
- Measurement & Analysis, led by Mary Kwasny, ScD, professor of Preventive Medicine in the Division of Biostatistics, which will help design and conduct analyses across all aging programs.

Recent Northwestern Medicine research in this area has shown that targeted interventions to support asthma self-management significantly improved outcomes and medication adherence in older adults, while certain educational tools to help patients manage complex drug regimens do not work.

Michael Wolf, PhD, MPH '02, associate vice chair for research in the Department of Medicine and professor of Medical Social Sciences, is the director of the new Center for Applied Health Research on Aging.

"At Northwestern, we have a very large portfolio of research that focuses on many different aspects of aging," Wolf said. "With CAHRA, the aspiration is to have a venue that can bring together Northwestern aging researchers so that we might innovate together and improve the care provided to the increasing number of Baby Boomers reaching older age and facing considerable healthcare needs. At this time, our health system is not fully prepared to manage all of the issues presented by older patients, as well as by their families who may play integral roles in their care. A mission of CAHRA will be to simplify the burden of treatment, while better engaging patients and families over time."

The Center will also be home to a Clinical Psychology Training Lab, which trains pre- and post-doctoral fellows within Feinberg's clinical psychology PhD program behavioral medicine track, allowing an immersive experience in CAHRA's aging research projects.

Research and education like this has the ability to cut across departments and have an impact in a short amount of time, according to Ron Ackermann, MD, MPH, director of IPHAM and senior associate dean for public health.

"This new Center will enable Northwestern University to contribute much greater impact through aging research, particularly in areas such as improving the quality, effectiveness, safety and equity of healthcare for older adults," Ackermann said. "Michael is extremely collaborative and has the vision and passion to bring faculty together and inspire exciting new collaborations that will drive innovation and amplify our collective impact in the field of healthy aging."

Investigating How Hospital-Acquired Bacteria Cause Severe Infections

Alan Hauser, MD, PhD, vice chair, Department of Microbiology-Immunology, and professor of Microbiology-Immunology and Medicine (Infectious Diseases)

The laboratory of Alan Hauser, MD, PhD, investigates the pathogenesis of multidrug resistant bacteria. Hauser and his team's other interests include the use of genomic approaches for the identification of novel virulence determinants and the development of novel translational approaches to treat bacterial infections. Hauser's study exploring how pneumonia strains compete in the lung was published this past spring in *Infection and Immunity* (read more here).

Recently, Hauser also helped Chicagoland high school students test a novel concept they had invented: the PeelTowel, a citrus peel-based, anti-microbial paper towel. Their findings were published in the *Journal of Emerging Investigators*, a peer-reviewed journal that highlights science by middle and high school students (read more here).

Q&A

What are your research interests?

My main research interest is in the area of bacterial pathogenesis. My laboratory strives to better understand how hospital-acquired bacteria cause severe infections. Many of the most problematic bacterial infections, such as those caused by Pseudomonas aeruginosa, Klebsiella pneumoniae and Acinetobacter baumannii, occur after patients come into contact with healthcare institutions. Not only are these infections associated with high mortality rates, but the bacteria that cause them are becoming increasingly resistant to antibiotics, making optimal treatment difficult and sometimes impossible.

My group uses a variety of approaches, including molecular techniques, genomics, microscopy, cell culture and animal models to dissect the pathogenic mechanisms of these bacterial pathogens.

What is the ultimate goal of your research?

Our goal is to better understand the mechanisms used by hospital-acquired bacteria to cause disease so that new vulnerabilities in their pathogenesis can be uncovered and exploited. Bacteria, even within a species, are quite genetically heterogenous, and one of our aims is to perform comparative genomic studies on bacterial populations to determine why some bacteria within a species are so much more aggressive than others and how this impacts disease outcomes.

Our ultimate goal is to extend the personalized medicine approach to include not only the patient's genome but also that of the pathogen infecting him or her. A second aim is to understand at the molecular level the virulence toolkits used by these pathogens to overcome host defense barriers. A third aim is to use molecular techniques to better understand the transmission and epidemiology of these pathogens. For example, we have identified a multidrug-resistant strain of P. aeruginosa that has persisted in our hospital for at least 16 years. Even though most P. aeruginosa strains are relatively rare, this strain has been cultured from patients throughout the world. We suspect strains such as this one possess genes that confer the ability to be more easily transmitted from patient to patient or to better persist in the environment.

Using a variety of approaches, we are attempting to identify these genes and characterize their products. It is my hope that such knowledge will contribute to efforts to develop novel preventative and therapeutic strategies.

What types of collaborations are you engaged in across campus (and beyond)? Northwestern University is the home of many outstanding research groups with expertise relevant to bacterial pathogenesis, and collaborations have been a key to my success. My laboratory is part of the NIH-funded Successful Clinical Response in Pneumonia Therapy (SCRIPT) Systems Biology U19 grant to explore how the pathogen, the microbiome and the host together dictate outcomes in patients with ventilator-associated pneumonia. This multidisciplinary project includes Richard Wunderink, MD (the PI of the grant), Benjamin Singer, MD, PhD, and Alexander Misharin, MD, PhD (all from the Division of Pulmonary and Critical Care); Patrick Seed, MD, PhD (Pediatrics); Chao Qi, PhD (Pathology); and many other talented investigators across both campuses.

Continued on page 7

Studying How Changing Inputs and Processes in the Health System Translate to Changes in Health Outcomes

Ado Rivera, second-year student in the Health Sciences Integrated PhD Program

Q&A

Where is your hometown?
I grew up in Caloocan, Philippines. It's a city just north of the capital.

What are your research interests?
My field is health systems research. When I say health system, I follow the World Health Organization definition of "all organizations, people and actions whose primary intent is to promote, restore or maintain health," and not limit it to just healthcare organizations.

Specifically, I am interested in studying how changing inputs and processes in the health system translate to changes in population health outcomes, especially in the context of low- and middle-income countries. Example of system changes include introducing a new health financing scheme, health worker deployment programs or restructuring the health information system.

I enjoy the fact that I need to always deal with complexity, since a change in one component would always affect others, often in unpredictable ways. I also like that I get to use various methodologies and with different forms of data. It's quite fun switching between quantitative and qualitative projects and utilizing different ways of thinking.

What exciting projects are you working on?
Currently, I'm working with colleagues in the Philippines on studying how government hospitals comply with a no co-payment and out-of-pocket policy for poor patients mandated by the national social health insurance. Prior to this project, we've evaluated the effectiveness of the policy in protecting patients from catastrophic health expenditures.

This time, we shifted our focus to implementation issues. Since the national insurance program operates on a capitation scheme, hospitals must shoulder the excess costs of admission. We are studying how hospitals are providing the necessary services without draining their financial resources. We're in the process of analyzing the focus group discussions and I'm enjoying reading how hospitals have been in implementing the policy.

What attracted you to the PhD program?
My PhD program was one of the few programs I found where one can specialize in health services research. That was one of the main pulls for me.

Another big draw was that the program was interdisciplinary and embraces the need for multiple methodologies and perspectives in studying health service and health system issues. I've always thought that health research demands a mixed-methods approach just because of the complexity and interconnectedness of the phenomena we study.

Finally, the program assures full funding support (through fellowships and assistantships) even for international students. I wouldn't have been able to pursue graduate studies without this support and it's nice not to constantly worry about where to find funds so I can focus on performing research.

What has been your best experience at Feinberg?
I've really enjoyed working on projects with various researchers outside my general field. I've worked with Dr. Megan McHugh studying how shift work affects health, especially in the manufacturing industry. I've also worked with Dr. Claudia Hawkins tracking how HIV and Hepatis B interact and affect the liver health of people with HIV in Nigeria.

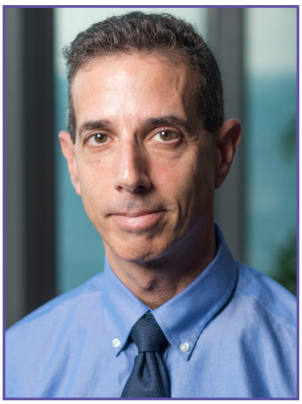
This month, I've started working with Dr. Matt Feinstein who focuses on HIV and heart disease. Through these projects, I was able to apply skills I've learned in the classroom as well as teach myself some new things. I also gained some soft skills that I think would be useful in the future. The PhD tends to be such a solitary experience, and this opportunity to work with other people or in teams is so valuable. It's also nice that the principal investigators I work with are nice people who willingly provide opportunities for me to grow as a researcher.

How would you describe the faculty at Feinberg?
Faculty at Feinberg are very supportive and approachable. I have not met anyone who has been dismissive of my ideas, and they are always willing to extend help or point me to someone who can help me translate my idea into reality.

What do you do in your free time?
I prefer to escape reality during my free time by reading fiction — usually science fiction, fantasy and manga. Although escaping is not always successful, since most of the sci-fi today includes a social issue that reflects what is happening in our world. I'm also part of a student hip-hop/urban dance group.

Supporting the Research Enterprise

Jeffrey Weiss, PhD, director for Research Core Planning and Research Analysis in the Dean's Administration



Q&A

Where are you originally from?
I'm originally from New York, though I haven't lived there since I left for college.

What is your educational background?
I graduated from Penn State with a degree in biology, and then went straight to graduate school at the University of Virginia, where I earned my PhD in physiology in 1987.

Please tell us about your professional background.
I did my post-doctoral fellowship at Massachusetts General Hospital in Boston and stayed on as an instructor before I was recruited to Northwestern as an assistant professor in 1993. I took a year off from academia and worked as a management consultant at McKinsey & Company in Chicago, but ultimately came back to Northwestern. About eight years ago, I left the lab and moved into the medical school administration, so I've spent most of my professional career at Northwestern.

Why do you enjoy working at Northwestern?
First, I work with a fantastic team. The staff I work with are dedicated to helping our investigators get their research done, and the senior administrators I work for, right up to the dean, are very supportive of the work I do. Second, it's an exciting time to be here. The medical school is growing fast, which creates all sorts of interesting opportunities. I look forward to coming to work every day.

How do you help scientists or research students at the medical school?
I have two roles in the medical school dean's office. I'm the director for Research Core Planning, so I oversee the program that supports about 30 shared facilities in Feinberg. We provide everything from financial support to software development, and we also monitor compliance with federal regulations.

Independently, I'm the director for Research Analysis. In that role I compile data from a variety of sources to measure the performance of individuals and departments in Feinberg, which helps the senior administration with strategic decision-making. We also build tools that allow the departments and centers to easily access the data, so it's a very transparent process that helps them plan as well.

What is your favorite part of the job?
I have a lot of freedom to take on new initiatives and to develop and deploy new tools, mainly software. I'm constantly learning something new.

What exciting projects are you working on?
The university recently site-licensed Tableau, a data visualization tool. Tableau allows us to publish intuitive and responsive dashboards — whether simple or complex — that give non-technical users access to both raw data and summaries.

That may not sound like a big deal, but many people struggle to get the information they need from the university's other systems, which tend to be difficult to navigate. The ability to put more information into people's hand is pretty satisfying after years of trying to do exactly that with far less effective tools.

What do you like to do in your spare time?
I'm an avid cyclist. I ride two to three thousand miles year, everywhere from my lakefront commute to the mountains in Colorado and Wyoming.

Welcome New Faculty

Barbara Stranger, PhD, joins as associate professor of Pharmacology and member of the Center for Genetic Medicine. Following postdoctoral training at the Wellcome Trust Sanger Institute in Hinxton, UK, she held faculty positions at Brigham and Women's Hospital and the University of Chicago, investigating the genetic basis of gene expression variation. The research focus of her lab is to disentangle the relationship between genetic variation and complex trait variation in humans. She approaches this broad topic through a combination of computational and experimental genomics approaches, combining statistical genetics with gene regulation. She is a member of several large-scale International genetics consortia, including: the Genotype-Tissue Expression Project, the Encyclopedia of DNA Elements (ENCODE), the Psychiatric Genomics Consortium and others. Her ongoing NIH-funded research focuses on the role of sex in the genetics and genomics of complex traits, including cancer, immune-mediated disease, neuropsychiatric disorders and cardiac phenotypes.

Research in the News

WTTW News, October 3

Researchers Develop Blood Tests to Detect Diabetic Complications, Cancer Wei Zhang, PhD, was quoted.

Crain's Chicago Business, October 17

A Northwestern investigator aims to fight the opioid crisis with an implantable device John Rogers, PhD, was quoted.

▶ This research was also featured in WTTW News.

Newsweek, October 22

Possible Celiac Disease Nanotechnology Treatment Breakthrough Revealed Stephen Miller, PhD, was quoted.

CNN, October 28

What makes soda so addictive? Marilyn Cornelis, PhD, was featured.

Associated Press, October 31

Science Says: How daylight saving time affects health
Phyllis Zee, MD, PhD, was quoted.

▶ This research was also featured in The New York Times, U.S. News & World Report, Fox News, and others.

More media coverage available online.

Hauser Continued from page 4

What aspects of your position do you particularly enjoy?

I feel fortunate to be able to teach and train the next generation of researchers and have dedicated a substantial portion of my time to this. In addition to mentoring graduate students and postdoctoral fellows in my laboratory, I supervise the research phase of the Infectious Disease Fellowship Program and am PI of their NIH T32 training grant. I also am PI of an NIH K24 award dedicated to training physician-scientists at the fellow and junior faculty level. My trainees return the favor by constantly reminding me that it is not only a privilege to be able to do biomedical research but that it can be fun, too.

How is your research funded?

The majority of my funding comes from the National Institutes of Health. The NIH-funded SCRIPT U19 award has allowed us to partner with a number of Northwestern investigators to apply systems biology approaches to ventilator-associated pneumonia. We have several ongoing projects relevant to P. aeruginosa infections in individuals with cystic fibrosis, supported by the Cystic Fibrosis Foundation. We have also received grants from the American Cancer Society, American Heart Association and Chicago Biomedical Consortium. Our foray into the field of Klebsiella pneumoniae infections was made possible by a generous seed grant from Feinberg.

Northwestern University NUCATS Clinical and Translational Sciences Institute

NUCATS Corner

NUCATS Increases NMH Clinical Research Unit Outpatient Capacity to Support Growing Research Portfolio

The NUCATS Center for Clinical Research (CRU) is pleased to announce the opening of its expanded adult Clinical Research Unit in the Northwestern Memorial Hospital (NMH) Galter Pavilion on the 15th floor. This additional outpatient capacity will continue the NMH CRU's long-held tradition of supporting excellence in clinical research by providing Northwestern investigators with experienced research nursing support and exemplary facilities and core lab capabilities.

The additional 6,300 square feet of outpatient research space will support NUCATS' commitment to accelerating leading-edge clinical and translational research discoveries and improving human health. The expansion includes an additional 15 exam rooms (including three rooms equipped with TVs for long infusions), three procedure rooms and touch-down workspace for coordinators. The space also includes an ADA bathroom, as well as hydraulic exam tables, to accommodate participants with mobility limitations. The NMH CRU Core Lab also received a significant expansion to provide new services, such as enzyme-linked immunosorbent assays (ELISAs), in addition to services already offered.

To learn more about NUCATS CRU, please visit our website: https://www.nucats.northwestern.edu/resources/clinical-research-support/index.html

To utilize the CRU's services, please submit your request here: http://j.mp/1SZiiOe

Who inspires you?

My inspiration comes from both ends of the professional spectrum. Among established scientists, my graduate school advisor, Pat Schlievert, taught me the value of hard work and passion. My postdoctoral mentor, Joanne Engel, showed me the value of asking important questions. I am also inspired on a daily basis by the enthusiasm of the junior investigators with whom I work. They remind me that, even when the glass is half empty, there is still plenty to drink.

Sponsored Research

PI: Denise Scholtens, PhD, director, Northwestern University Data Analysis and Coordinating Center, and chief of Biostatistics in the Department of Preventive Medicine

Sponsor: National Institute of Diabetes, Digestive and Kidney Diseases

Title: Glycemic Profile of Pregnancy Consortium Biostatistics Research Center

Maternal hyperglycemia during pregnancy is a known risk factor for high birthweight, excessive newborn adiposity, and related pregnancy complications, including cesarean delivery, shoulder dystocia and birth injury. Sequelae of elevated pregnancy glucose are not limited to the perinatal period. Mothers meeting criteria for gestational diabetes are more likely to develop long-term metabolic disorders including Type 2 diabetes. Maternal glucose also has an apparent sustained influence on fetal programming, with offspring of hyperglycemic mothers at higher risk of both excess adiposity and disordered glucose metabolism throughout childhood and into adolescence.

While debate exists as to specific criteria that should be used for diagnosing gestational diabetes, it is the case that adverse maternal and offspring outcomes related to both anthropometrics and glucose metabolism, both at delivery and over a decade later, are associated with maternal glucose values across the continuum. Existing diagnostic criteria for gestational diabetes are based on measures of maternal glucose, typically at ~28 weeks gestation. To more fully elucidate maternal glycemia and identify potential early indicators of gestational diabetes, Clinical Centers comprising the National Institute of Diabetes and Digestive and Kidney Diseases Glycemic Profile of Pregnancy Consortium will be charged with designing a multicenter observational study of pregnant mothers without pre-existing diabetes to richly characterize maternal glycemic profiles using sensor-based continuous glucose monitoring technology.

The Northwestern University Biostatistics Research Center proposes to serve as a central leadership hub for the Glycemic Profile of Pregnancy Consortium, coordinating all data-related and operational activities using cutting-edge resources for study design, planning and conduct, ongoing data monitoring and statistical analysis.

Read more here.

PI: Harris Perlman, PhD, chief of Rheumatology in the Department of Medicine and the Mabel Greene Myers Professor of Medicine in the Division of Rheumatology

Sponsor: National Institute of Arthritis and Musculoskeletal and Skin Diseases

Title: Synovial Macrophage Transcriptional Signatures for Predicting Therapeutic Efficacy

Despite the many therapies for patients with rheumatoid arthritis (RA), there is little information to guide selection of the most effective treatment for an individual patient. Forty-sixty percent of patients with RA respond (defined by ACR50 response criteria) to conventional disease modifying anti-rheumatic drugs (cDMARDs) or cDMARDs plus anti-tumor necrosis factor (TNF) therapy. Moreover, 20 to 40 percent of RA subjects in clinical trials never demonstrate even a minimal response (ACR20 response criteria). Hence, there is a clear need to develop precision-based therapy for patients with RA, whereby novel biomarkers will enhance our ability to predict therapeutic response and limit ineffective therapy. For the most part, peripheral blood has been utilized for identifying predictive biomarkers, but these studies lacked sufficient precision to allow their incorporation into clinical practice. Thus, similar to an oncologist, who identifies mutations through sequencing of tumor biopsies to direct therapy, our approach is to biopsy the synovium, the target organ in RA, to identify changes that reflect sensitivity or resistance to a particular therapy.

We brought together six leading medical centers to create REASON, a consortium with an established framework for patient recruitment, curation of clinical data, ultrasound-guided synovial biopsies, cell sorting, RNA sequencing (RNA-seq), and computational analyses. Our data show that macrophages isolated from ultrasound-guided synovial tissue biopsies obtained from patients with RA are sufficient for RNA-seq, exhibit transcriptional differences across patients with RA, and, importantly, set the framework for the stratification of patients with RA according to the most prominent disease pathway. We are the first to identify six transcriptional modules of co-regulated genes from isolated synovial macrophages via ultrasound-guided synovial biopsy that are individually associated with clinical disease status and cDMARD or biologic therapy (bDMARD). This study established REASON as a leader in the United States for ultrasound-guided synovial biopsies and demonstrates the feasibility and therapeutic potential of isolating low numbers of synovial macrophages for RNA-seq to establish a precision-medicine approach for RA therapy and to understand pathobiology.

Read more here.

Funding

Accelerating Discovery of Efficacious Pre-erythrocytic Stage Malaria Vaccines (U01 Clinical Trial Not Allowed)

More information

Sponsor: National Institute of Allergy and Infectious Diseases (NIAID)
Letter of Intent Due: December 17
Submission Deadline: January 17, 2020
Amount: $6M to fund four to six awards in fiscal year 2021

Synopsis: The purpose of this initiative is to stimulate basic research, discovery and early translational research to enable and accelerate the generation of highly efficacious pre-erythrocytic stage malaria vaccines, including sporozoite-based vaccines. The goal is to generate one or more promising vaccines against human malaria superior to currently available sporozoite-based vaccines that are suitable for further downstream process development and future clinical evaluation. Collaboration among investigators with backgrounds in malaria vaccine research and other basic research areas such as parasite biology, parasite genomics, pathogenesis and host immunology are highly encouraged to apply.

BRAIN Initiative Cell Census Network (BICCN) Specialized Collaboratory on Human and Non-Human Primate Brain Cell Atlases (U01 Clinical Trial Not Allowed)

More information

Sponsors: National Institute of Mental Health, National Eye Institute, National Institute on Aging, National Institute on Alcohol Abuse and Alcoholism, National Institute of Biomedical Imaging and Bioengineering, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institute on Deafness and Other Communication Disorders, National Institute on Drug Abuse, National Institute of Neurological Disorders and Stroke, National Center for Complementary and Integrative Health

Letter of Intent Due: December 24, 2020
Submission Deadline: January 24, 2020
Amount: $8M to fund three to six awards

Synopsis: This funding intends to support a group of "Specialized Collaboratories" that will adopt scalable technology platforms and streamlined workflows to accelerate progress toward establishing comprehensive molecular and anatomical reference cell atlases of human brain and/or non-human primate brains. A central goal is to build a brain cell census resource that can be widely used throughout the research community.

NIA Behavioral and Social Research Leaders in Alzheimer's Disease and its Related Dementias (NIA BSR LEADR) (DP1 - Clinical Trial Not Allowed)

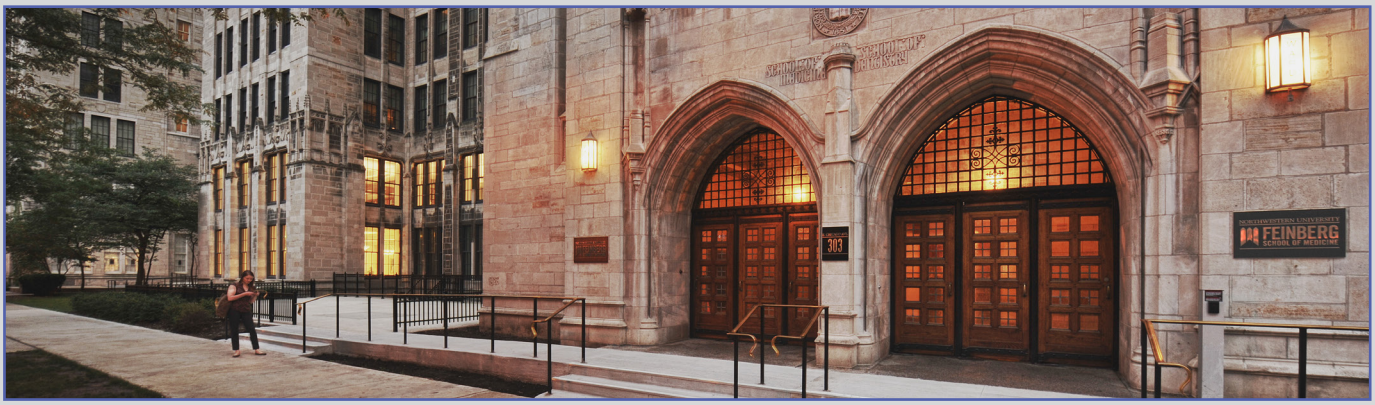
More information

Sponsor: National Institute of Aging (NIA)
Letter of Intent Due: January 3, 2020
Submission Deadline: February 3, 2020
Amount: $1.6M in total costs to fund two awards in fiscal year 2020

Synopsis: The NIA BSR LEADR program supports individual scientists of exceptional creativity who propose to use behavioral and social science perspectives and approaches for highly innovative, impactful and potentially transformative theoretical, empirical and clinical research addressing the challenges raised by Alzheimer's disease and Alzheimer's disease-related dementias (AD/ADRD) for individuals, their families and society. Applications must reflect a new insight into a potential solution to an important problem related to AD/ADRD – such as dementia care, dementia caregiver research, cognitive and dementia epidemiology, behavioral and social pathways of AD/ADRD, among other topics – that can be addressed with exceptionally innovative or unconventional behavioral and/or social science methods. This initiative will support investigators who intend to pursue new research directions distinct from those they currently or previously conducted.

View more funding opportunities

Getting Started on Your Systematic Review: The PRISMA-P Checklist



By Q. Eileen Wafford, Research Librarian

Systematic reviews are time-intensive research projects that require teams to find, appraise, and synthesize all the available evidence to answer a research question. To do this, teams are expected to apply a systematic methodology that includes the development of a comprehensive search strategy, two screening phases, and the adoption of tools to assess bias, rate quality, and extract data from the literature. Teams pursing meta-analysis have to take into account additional statistical requirements.

While many review teams successfully publish their systematic reviews, many teams stall somewhere along the process for various reasons. Teams interested in successfully completing a systematic review should plan the process using the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) checklist. Completing the checklist will help teams understand the logistics of conducting a systematic review and allot time to meet the project's demands.

The PRISMA-P checklist contains three sections with 17 items considered essential elements of a systematic review. The following highlights selected items.

Section 1: Administrative Information

This section establishes the foundation of the review. Although systematic reviews require a minimum of two authors, teams may draw upon people with expertise in the subject matter, literature searches, and statistical analysis. Contributors who make "substantive intellectual contributions" should be listed as an author (Item 3a). Teams should also register (Item 2) their completed protocol to reduce bias and arbitrary decisions, promote transparency, and prevent duplication. Teams can register their protocol on PROSPERO, a free registry of systematic reviews protocols.

Section 2: Introduction

Use this section to explain the rationale (Item 6) and objectives (Item 7) behind the systematic review. The PICO (Patient/population/problem, Intervention/exposure, Comparator, and Outcomes) framework will help teams identify the key components of their research question. The PICO elements are similarly instrumental in identifying information for the eligibility criteria (Item 8) in the Methods section.

Section 3: Methods

The items listed in this section help teams define their plan to find, select, process, and analyze information about the research question. To minimize publication bias, teams should consider a range of bibliographic databases and grey literature sources for their information sources (Item 9). There are resources to assist with data management (Item 11a) including EndNote. Online screening tools such as Covidence and Rayyan can assist with the selection process (Item 11b).

While tools for data collection (Item 11c) and assessing the risk of bias (Item 14) should be appropriate for and tailored to the research question, teams can find examples such as the data extraction form adapted from the Cochrane Collaboration and risk of bias checklists on the Tools for Reviewers GalterGuide page. Galter Library has statistical books with additional information on data synthesis (Item 15). Teams that are interested in a meta-analysis should consider contacting the Biostatistics Collaboration Center (BCC) for further assistance. To report the confidence in cumulative estimate (Item 17), teams should review the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.

The resources listed above are just of few of many that may help systematic review teams plan their reviews using the PRISMA-P checklist. Review teams can and should similarly consult with a librarian at the outset of the project. Librarians at Galter can work with teams as consultants where a librarian provides guidance on the process. Librarians can also assists as collaborators/co-authors which includes research question and search strategy development to running the searches in all the databases. Talk to your librarian to learn more about conducting a systematic review.

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."

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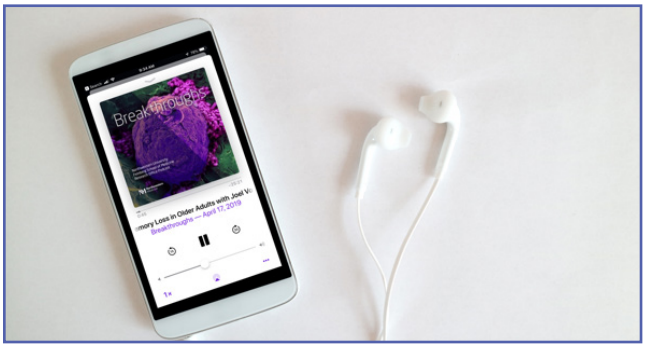

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NIH News

Delving Further Into the Funding Gap Between White and Black Investigators

Studies show that black scientists are less successful than their white counterparts in obtaining NIH R01 awards as designated principal investigators (more research here). In a paper published in Science Advances, NIH analyzed over 150,000 R01 applications and identified disparate outcomes associated with funding gaps between black and white investigators, including 1) the decision to bring applications to discussion during peer review study section meetings; 2) impact score assignments for those applications brought to discussion; and 3) topic choice (i.e., what investigators chose to study). For an overview of findings and potential implications, visit NIH deputy director for Extramural Research, Michael Lauer's Open Mike blog post.

Finding Key NIH Contacts

The NIH Grants & Funding website has a wealth of information to help applicants and grant recipients navigate application submission and grant administration requirements. For additional information, NIH encourages applicants to reach out to NIH staff, particularly staff at an NIH institute or center. Visit the Contacting Staff at the NIH Institutes and Centers page for a breakdown of the roles of NIH staff and to locate the right contact at each phase of the application and award process. For issues navigating eRA systems, check out the general Help page for eRA Service Desk and other general support contacts.

Research Career Development (K) Award Resource Round-up

If you are a K award recipient or are interested in applying for a K award, visit the following resource links to learn more and find answers to frequently asked questions:

- Clarifying Percent Effort and Support for Career Development (K) Awardees
- The NIH Grants Policy Statement provides helpful information on:
    - Level of effort
    - Concurrent support
    - Temporary adjustments to the percent effort requirement
- Visit the Research Career Development Awards page for current funding opportunities and policy notices.
- Frequently Asked Questions

Still have questions about percent effort for your K award, or for a specific K award PI? Contact the grants specialist listed on the notice of award for tailored guidance. General policy questions may be directed to the Division of Biomedical Research Workforce at NIHTrain@mail.nih.gov.