

Breakthroughs

Feinberg School of Medicine Research Office

November 2020



This visual depicts the death of neurons in the aging brain. Healthy aging is a theme cutting across Feinberg's research enterprise.

Investigating the Biology of Aging

By Will Doss

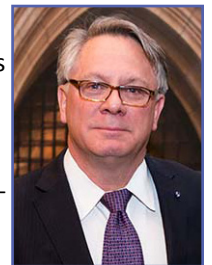
For some people, age really is just a number. The complex biological changes associated with aging affect nearly every aspect of one's health, but some people are less affected than others. Investigators at Feinberg are studying populations that seem resistant to some of the negative consequences of aging — such as certain members of an Amish community in Berne, Indiana or a group of cognitively young octogenarians termed “SuperAgers” — in an attempt to figure out exactly what makes them different.

Other scientists are interested in seeking biological levers; approaches to minimize the impact of aging and extend the healthy lifespan, or health span, of older adults. Whether it's improving recovery after pneumonia, which can cause functional deficits for the rest of older adults' lives, or boosting the quality of sleep, which can redound in better cardiovascular and neurological health — Feinberg investigators are breaking down the mechanisms of aging and designing solutions to extend healthy living.

Cellular Senescence

The physical symptoms of aging are well known to all of us — skin wrinkling, hair graying and falling out — but what happens within individual cells is less obvious.

[Douglas Vaughan, MD](#), chair and Irving S. Cutter Professor of [Medicine](#), has spent years studying senescence, the process of old cells losing their regenerative capabilities. The cells don't die, but they are often less effective and in repairing and preventing age-related conditions: Arterial walls stiffen and blood pressure rises, hearing is less sensitive and lung capacity is reduced, to name a few examples.



Douglas Vaughan, MD

“Nearly every organ system has a specific aging-related physiological alteration that can be measured,” Vaughan said.

Simply turning senescence off would be a fool's errand, according to Vaughan, as restraining cell proliferation is a key safeguard against rampant cell growth and cancer. However, an extended family of Old Order Amish living in Indiana gave Vaughan a framework for what might be effective.

Some members of this family — descended from Swiss immigrants — share a genetic mutation that causes very low levels of plasminogen activator inhibitor (PAI-1), a protein that is a marker and a mediator of cell senescence. In a study [published](#) in *Science Advances*, Vaughan found people that carry a single copy of this genetic variant live more than 10 percent longer and exhibit preserved cardiovascular flexibility, as well as protection from diabetes and lower fasting insulin levels.

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Biology of Aging *(continued from cover page)*

Aging is a multi-morbidity condition and while there are drugs that treat selective components associated with aging — statins that lower cholesterol or ACE inhibitors that lower blood pressure — playing whack-a-mole with the multitude of age-related conditions is an improbable task for clinicians.

“Aging is not just cancer or cardiovascular disease, selective components associated with multiple different diseases at once,” Vaughan said. “That creates a huge challenge to treat people as they age, and a huge cost on our healthcare system.”

Instead, a drug such as a PAI-1 inhibitor that deals with the underlying mechanisms of aging is a much more attractive option, according to Vaughan.

“If you target the very fundamental mechanisms that drive senescence, you could have a single drug or combination of drugs that treat multiple systems and push back the onset of aging-related multi-morbidity,” Vaughan said.

Listen to a [podcast](#) with Vaughan about using a PAI-1 inhibitor in a new phase 2 COVID-19 clinical trial.

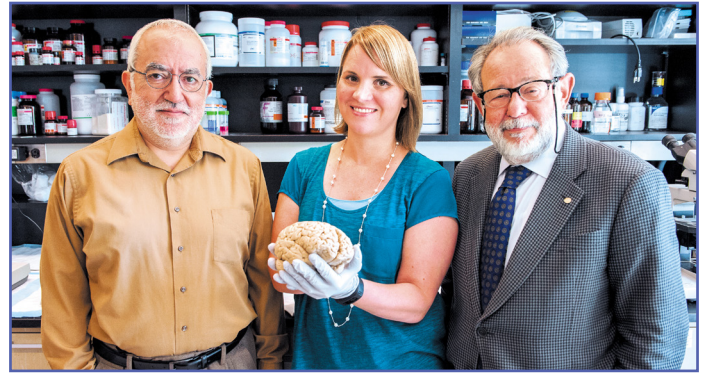
Super-Aging

Much like cardiovascular health naturally declines as people age, so does cognitive function. The hippocampus, a region important for memory, shrinks over time and the cortex, the outer region of the brain, gets thinner.

This translates into worsening episodic memory and cognitive performance, but this decline is not evenly distributed. In young people, cognitive performance is more or less the same, according to [Emily Rogalski, PhD](#), professor of [Psychiatry and Behavioral Sciences](#), but as people age that variability increases.

“That’s when we see individuals far below average, and that’s what we associate with pathologic aging such as Alzheimer’s dementia,” Rogalski said.

By that same token, there are people whose memory function is much better than expected. These people, termed “SuperAgers,” seem to be resistant to age-related memory decline — even in their 80s, they have similar memory



Emily Rogalski, PhD, pictured with Changiz Geula, PhD (left), and M. Marsel Mesulam, MD (right).

function to peers in their 50s.

Surprisingly, these SuperAgers exhibited tremendous variation among traditional indicators of healthy aging, such as education, wealth and lifestyle factors like alcohol use or exercise. However, one thing that set them apart was a high population of specialized brain cells called Von Economo neurons.

These neurons are theorized to be important for social interaction: They are only found in complex species with high sociality such as elephants, dolphins and whales, and patients with dementia disorders often have substantial losses of these neurons.

SuperAgers have four to five times the number of Von Economo neurons and reduced rate of cortical thinning when compared with normal aging adults, according to a study [published](#) in *JAMA*, demonstrating SuperAgers have biologic differences from their average peers.

In addition, SuperAgers reported more positive relations with others than average amongst peers of their age, tying back to the theme of socialization, Rogalski said.

“It shows the practical value of staying socially connected — not only does it make you feel good, but it might be good for your brain.”

There are still many questions about SuperAgers: Were they born with more Von Economo neurons? Did they acquire them at some point in their life? Either way, Rogalski continues to track their cognitive trajectory, hoping to nail down what exactly makes them “super.”

“I think there’s a lot more to come,” Rogalski said. “Understanding the biology, psychology and social aspects of SuperAging may provide practical leads for avoiding Alzheimer’s disease and living well in older age.”

Critical Points

Studying populations who exhibit resistance to age-related decline is a valuable window into how aging works and hints at future methods that could help mitigate its worst effects. However, some Feinberg investigators are doing work further down the pipeline, examining the impact of certain conditions

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Biology of Aging *(continued from previous page)*

or therapies and evaluating how they might be used to ameliorate symptoms of aging.

One critical condition in older adults is pneumonia, which can often result in hospitalization and permanent lung, muscle and neurologic decline in older adults, according to [Scott Budinger, MD](#), the Ernest S. Bazley Professor of Airway Diseases and chief of [Pulmonary and Critical Care](#) in the Department of [Medicine](#).



Scott Budinger, MD

Because all the blood in the body is routed through the lungs to oxygenate, infection in the lung or pneumonia can have long-lasting consequences in a variety of body systems: Older adults discharged from the hospital after pneumonia have an elevated risk for heart attack, kidney disease and dementia, to name a few.

“We think of it as a gateway to compounding multi-morbidity that limits health span at the end of life,” said Budinger, also a professor of Medicine in the Division of Pulmonary and Critical Care, of [Cell and Developmental Biology](#), and a member of the [Robert H. Lurie Comprehensive Center](#) of Northwestern University.

According to Budinger, one contributor to this decline is age-related alterations in macrophages, highly specialized cells that live within every tissue of the body.

After an infection, macrophages serve as a “garbage collector,” cleaning up excess fluid or depleted inflammatory cells that helped fight off the infection. With advanced age, these cells become dysfunctional — and resolution of inflammation is required for healing lung injury, according to a study Budinger [published](#) in *Science Advances*.

“The macrophages are unable to clean up the mess, essentially,” Budinger said. “This leads to impaired healing, secondary infections, chronic inflammation and other complications.”

Slowing or reversing this decline could dramatically improve the outlook for patients hospitalized with pneumonia and Budinger believes that restoring function in these macrophages is a promising possibility.

While Budinger is examining how drugs might restore macrophage function in patients after pneumonia, other anti-aging strategies involve continuous treatment, taking a targeted approach at this critical point could be a more clinically feasible strategy, Budinger noted.

“Giving an older patient medication in the narrow window of time when they’re recovering from their pneumonia is a lot more attractive than treating them for the rest of their lives,” Budinger said.

Sleep, Aging and Pink Noise

A pneumonia hospitalization is an opportunity to intervene and extend the health span of older adults, but it isn’t the only chance. In fact, there is an opportunity every night -- during sleep. As adults age, sleep becomes more fragmented, according to [Phyllis Zee, MD, PhD, ’87 ’89 GME](#), the Benjamin and Virginia T. Boshes Professor of [Neurology](#).

One reason the sleep cycle changes is that the deepest stage of sleep, characterized by slow oscillations in the brain, decreases with age and there is a shortening of circadian rhythm: the internal clock runs just slightly faster, Zee said.

“This could be why older individuals can’t stay asleep or are waking up at 4:00 a.m.,” Zee said.

Over time, sleep and circadian rhythm affect each other, amplifying mis-regulation and having impact throughout the body. Recent discoveries have shown poor sleep is an important risk factor for cardiovascular disease and Alzheimer’s disease.



Phyllis Zee, MD, PhD

To that end, Zee investigated the effects of using gentle sound stimulation to improve the quality of deep sleep. [Publishing](#) their findings in the journal *Sleep*, Zee and her collaborators found that “pink noise” boosted cardiovascular measures of sleep quality, helping neurons synchronize during deep sleep.

“I think of it like exercise or nutrition,” Zee said. “It’s an often-overlooked pillar of health and improving sleep could affect multiple systems in the body.”

Healthy aging is a theme cutting across Feinberg’s research enterprise and is seen as a strategic research opportunity for investigators. As the population of Americans aged 65 and older continues to grow, predicted to double by 2050, expect to see more Feinberg research projects and initiatives take shape across departments, centers and institutes.

Feinberg Investigator Receives \$1.8 Million CDC Grant for Gun Violence Prevention Research

By Gina Bazer

Northwestern has been awarded a three-year grant totaling \$1.8 million from the U.S. Centers for Disease Control and Prevention (CDC) to study gun violence — the first time in more than 20 years that federal funding has been appropriated for research related to firearm violence prevention at the CDC since Congress passed the Dickey Amendment in 1996, which effectively banned federal research on the topic.

[Linda A. Teplin, PhD](#), vice chair for Research in the Department of [Psychiatry and Behavioral Sciences](#), is the recipient of the grant and principal investigator of the study. Teplin and her colleagues will leverage the CDC funding to add an important layer to a larger investigation she is already conducting: *Next Generation*, the first prospective study of how high-risk parents' involvement with firearms influences that of their adolescent children. The study examines both the perpetration and victimization of firearm violence.

In its original iteration, *Next Generation* was designed to sample only one child per family; the new CDC grant allows the team to compare firearm involvement between siblings, said Teplin, who is also the Owen L. Coon Professor of Psychiatry and Behavioral Sciences and professor of Medicine in the Division of Infectious Diseases. *Next Generation* is also funded by three grants from the National Institutes of Health and two grants from the Department of Justice.

"Siblings can influence the initial involvement with firearms, the propensity to perpetrate violence and the probability of becoming a victim. Yet, we have few data," she said. "*Next Generation* is the first study to examine the role of siblings."

Teplin and her team — including co-investigator [Karen Abram, PhD](#), professor of Psychiatry and Behavioral Sciences, and [Leah Welty, PhD](#), professor of Psychiatry and Behavioral Sciences and of [Biostatistics](#) in the Department of [Preventive Medicine](#) — will examine patterns of firearm involvement in concordance and discordance between siblings; the influence of parents' firearm involvement on their children's involvement (focusing on differences between siblings) and finally, identify risk and protective factors that explain within- and between-family differences. The sample will be composed predominantly of socioeconomically disadvantaged Black Americans and Hispanics — groups that, Teplin says, face the most grievous consequences of firearm violence.

"The critical question is, 'Why is one sibling able to avoid firearm involvement while the other is not?'" Teplin said. "Studying two children per family provides an unprecedented opportunity to examine resilience," added Abram. "Siblings



From left to right, co-investigators Karen Abram, PhD, professor of Psychiatry and Behavioral Sciences and Linda A. Teplin, PhD, received a three-year grant that will fund the first-ever study looking at how sibling relationships influence firearm involvement.

share the same family, neighborhood and often the same school environment, as well as roughly half their genes. Thus, they act as natural 'controls' for each other." Findings will guide the development and adaptation of preventive interventions for the highest-risk families.

Northwestern is one of several institutions awarded funding from the \$25 million appropriations bill. Previous federal funding for gun violence research had been restricted since 1996, when Arkansas Congressman Jay Dickey included a rider in a spending bill to prohibit the CDC from funding research that could be seen as advocating gun control. This provision effectively stopped gun violence studies. Illinois Senators Dick Durbin and Tammy Duckworth are co-sponsors of the Gun Violence Prevention Research Act, which sought to authorize this funding.

Teplin believes the bill will "redress the current imbalance in funding."

"Although firearm violence is the second leading cause of death in adolescents, over 50 times more scientific articles are published on childhood cancer — the fifth leading cause of death. And poor urban children — particularly racial and ethnic minorities — have been disproportionately the victims of this imbalance," she said.

To learn more about *Next Generation*, along with its companion study, the *Northwestern Juvenile Project (NJP)*, the first-ever longitudinal study investigating the mental health and long-term outcomes of youth detained in the juvenile justice system, read "[Informing Policy](#)" in *Northwestern Medicine* magazine.

Graduate Student/ Post-Doc Events and Opportunities

Remote Wellness Coaching with Health Promotion and Wellness

Wellness coaching is a collaborative, non-judgmental process that can help you identify and achieve your health and wellness goals, balance dimensions of health and wellness and learn practical skills to improve overall well-being. Coaches work with you to build on your strengths and support you in creating sustainable plans to achieve your wellness goals related to physical activity, sleep, healthy eating, time management and stress management/ coping skills.

Students will typically meet with a coach for two-to-four sessions and have check-ins through email between sessions. Wellness coaching is available to Northwestern undergraduates and graduate/professional students. Sessions are one-on-one, confidential and free.

[Sign up for an initial appointment.](#)

Contact: hpaw@northwestern.edu

Virtual Mindful Yoga

Friday, November 20 and 27

Time: 5:30 p.m. to 6:00 p.m.

The pace of the class is moderate with poses ascending in complexity. A meditative, mindful approach is emphasized in all postures to develop greater internal awareness. Well suited for those with a yoga foundation – all levels are welcome.

[Register here](#)

Contact: Nancy Tierney, n-tierney@northwestern.edu

[More information](#)

[View and register for other virtual group exercise classes](#)

Workshop: Intro to Data Science

Tuesday, December 1

Time: 1:00 p.m. to 2:30 p.m.

This interactive workshop takes the first steps of data analysis by processing your data set to understand the overall aspects of the data. A Jupyter notebook is used for hands-on student exercises along with a set of lecture slides. Participants should have a basic knowledge of Python.

[Register here](#)

Contact: IT Communications, it-communications@northwestern.edu

[More information](#)

Mercy in the Museum: Online Collection Tours

Friday, December 11

Time: Noon to 12:30 p.m.

Join the Block Museum for a series of shared conversations about artworks from the collection that explore ideas of justice, race and equity. These online, discussion-based lunchtime tours are led by Block staff and inspired by “Just Mercy: A Story of Justice and Redemption,” the One Book One Northwestern reading selection for the 2020-21 academic year. This series is presented in conjunction with The Block’s 40th anniversary, a yearlong celebration of the museum’s collection as a tool to help reflect upon, question and reimagine the past.

[Register here](#)

Contact: Lindsay Bosch, lindsay.bosch@northwestern.edu

[More information](#)

Seed Money Available for Feinberg Faculty

The Feinberg Research Office encourages you to consider applying for funds through the [multi-investigator seed grant program](#). The program provides seed grants of up to \$30,000 to initiate new applications for multi-investigator program project or center grants involving Feinberg faculty.

The funds are intended to support new applications, preferably to the National Institutes of Health. There is an expectation of casting a wide net, such that research projects ought to involve at least two faculty members from outside the home department of the principal investigator, which may include Evanston.

To be considered for this seed funding:

1. Request On-Campus Retreat

Make a request to hold an on-campus retreat on a topic suitable for a multi-investigator application. In planning the

retreat, keep in mind that one of the expectations of the final application is to include those investigators across departments, including the Evanston campus, that best fit thematically and will produce the most compelling application. [On-Campus Retreat Form](#)

2. Submit Application

Based on the discussions at the retreat, provide the date for submission of an application, an abstract describing the application and the most coherent group of potential projects; then apply for remaining seed funding and begin assembling the application. Funds are paid against expense receipts provided by the awardee to the Office of the Dean.

[Seed Funding Form](#)

To learn more about the program and how to apply, visit the application [here](#).



Bettering the Quality and Safety of Healthcare Through Collaboration

Julie K. Johnson, PhD, MSPH, professor of Surgery in the Division of Surgical Oncology



[Julie K. Johnson, PhD, MSPH](#), is a professor of [Surgery](#) in the Division of [Surgical Oncology](#). Her research interests include improving the quality and safety of patient care and the qualitative evaluation of clinical microsystems through collaborative relationships and research opportunities. Her work has explored errors in ambulatory pediatric settings, how clinical teams function during inpatient medicine rounds and gender disparities in burnout among surgical residents.

Johnson is also a member of the Institute for Public Health and Medicine (IPHAM)'s [Center for Health Services and Outcomes Research](#) and the Northwestern University Clinical and Translational Sciences ([NUCATS](#)) Institute.

Q&A

What are your research interests?

My research is focused on the quality and safety of patient care and qualitative evaluation of clinical microsystems. I am also very enthusiastic about teaching – I currently teach in the [Center for Education in Health Sciences](#) where I lead two courses: Applied Qualitative Research Methods, and Fundamental Methods for Quality and Patient Safety. As a teacher, I have a special interest in developing and using serious games as a way to engage learners with important concepts related to understanding and improving the quality and safety of healthcare.

What is the ultimate goal of your research?

Ultimately, my research goals are to develop new knowledge about how frontline clinical teams function and how best to work with teams to improve their systems and processes of care. That has opened the door for many different configurations of research and funding.

How did you become interested in this area of research?

I completed a PhD in Evaluative Clinical Sciences at Dartmouth in 2000, and since that time, regardless of my specific research topic, the clinical microsystem has been the organizing framework for how I think about research and practice. The conceptual underpinnings of the microsystem are based on systems thinking, organizational development, leadership and process improvement. Most recently, I have become interested in “coproduction” and how we support frontline clinicians and patients to co-produce healthcare services.

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

For me, one of the things that I enjoy most about academia is the opportunity to work collaboratively with people within my department and the university, as well as the opportunity to build relationships with people in other research settings nationally and internationally. My academic home is the Surgical Outcomes Quality Improvement Center (SOQIC), where I am a co-investigator on several SOQIC grants, in particular a grant funded by the Agency for Healthcare Research and Quality with Dr. [Karl Bilimoria](#) to evaluate the Illinois Surgical Improvement Collaborative (ISQIC) and several NIH grants with Dr. [Jonah Stulberg](#) related to reducing surgical prescribing of opioids. Within Northwestern, I am also a co-investigator on an AHRQ-funded grant with Dr. [Kevin O’Leary](#) to redesign inpatient units caring for medical patients.

Beyond my Northwestern colleagues, I have had the opportunity to live and work in the United States, the Netherlands, and Australia, and I have led research projects in those countries. This has given me a unique perspective on international health systems, in addition to helping build a strong network of international research colleagues and ongoing opportunities. For example, I have been working with U.S. colleagues at the Hennepin County Medical Center in Minneapolis and in the Netherlands at Radboud Medical Center in Nijmegen on a Robert Wood Johnson Foundation funded project on patient experiences and outcomes integrating social and medical services for chronic conditions. In that study, we are examining social and medical services through a lens of coproduction.

Where has your work been published?

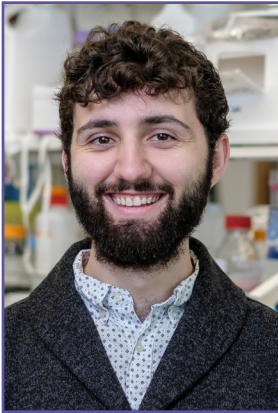
My research has been published in a variety of journals: [JAMA Surgery](#), [Journal of Surgical Research](#), [BMJ Open](#), [Journal of Hospital Medicine](#), etc. Essentially, I target journals that publish quality improvement and patient safety manuscripts.

Who inspires you? Or, who are your mentors?

One of my most important mentors has been Dr. Paul Batalden, who is professor emeritus of the Dartmouth Institute for Health Policy and Clinical Practice at Dartmouth College — he’s been a mentor since 1993! Paul is one of the early pioneers in quality improvement in the U.S. and I have learned so much from him about the importance of connecting research to practice. And he continues to connect me to interesting ideas. It’s been interesting to reflect on how our mentoring relationship has changed over the past 25-plus years. It’s definitely an experience that I draw on as I mentor, support or even offer to help more junior colleagues.

Secret Life of Bacteria

Corey Asimacopoulos-Kennelly, a fourth-year student in the Driskill Graduate Program in Life Sciences



Corey Asimacopoulos-Kennelly, a fourth-year student in the Driskill Graduate Program in Life Sciences, studies *Pseudomonas aeruginosa*, an antibiotic-resistant pathogen in the laboratory of [Arthur Prindle, PhD](#), assistant professor of [Biochemistry and Molecular Genetics](#) and at the [McCormick School of Engineering](#).

My then-girlfriend (now recently-married-wife) matriculated into a physics graduate program in Chicago, so I strongly preferred a program also in the Chicago area. Although I found myself interested in several Chicago-based biology programs, what stood out to me about Northwestern and the DGP is how collaborative the environment felt — not just within departments but also between departments.

I preferred to join an umbrella program like the DGP because of broader rotation options and having a core set of classes, which fosters connections between students — so now I am friends and acquaintances with other graduate students across many of the departments at Feinberg and can draw on their expertise.

What has been your best experience at Feinberg?

The Prindle laboratory started up only a few years ago, so one of my best experiences has been watching and helping shape the laboratory as it grows. I really appreciate the laboratory culture. Everyone's just so friendly and supportive!

Before the pandemic we would go out together for meals, have dinner parties, play board games — we even went rock climbing and bouldering together a couple of times!

How would you describe the faculty at Feinberg?

Faculty at Feinberg are intellectually curious, driven individuals. They are passionate about their field of expertise and about science in general. I have also found faculty here to be supportive and willing to take the time to personally help you even if they may not know you particularly well, which is a great boon for graduate students.

What do you do in your free time?

In my free time, I enjoy cooking and baking for and with my wife. We picked up rock climbing and bouldering as a hobby in 2019 and grew to look forward to climbing a couple times every month. Problem solving, technique and strength are all crucial for success and I've found the clear progression in climbing ability really satisfying.

We are also active in the Chicago Greek Orthodox community. In addition to other church ministries, we are docents for the Chicago Architectural Foundation at our parish (St. Basil) and we volunteer at an annual Greek food fest in Niles.

What are your plans for after graduation?

I plan to continue conducting scientific research after graduating. I will likely aim for a postdoctoral position in another academic microbiology lab in the Chicago area but I am also open to and interested in exploring industry positions.

Q&A

Where is your hometown?

I grew up outside of a small town in eastern Michigan called Clio. The nearest city is Flint and that is where I attended university for my undergraduate degree.

What are your research interests?

My research interests lie primarily within the field of microbiology, although I have also dabbled in cancer biology during my undergraduate training. I find bacteria fascinating and am generally interested in how bacteria sense and respond to their environment and how they regulate these responses.

What exciting projects are you working on?

I study *Pseudomonas aeruginosa*, an opportunistic pathogen that is frequently resistant to multiple antibiotics and causes many healthcare-associated infections worldwide. Nucleobases and related molecules like adenosine triphosphate (ATP) and cyclic adenosine monophosphate (cAMP) are important for DNA and RNA synthesis, metabolism and cell signaling.

While most bacteria are able to create nucleobase-related molecules through energy-intensive de novo synthesis pathways, many bacteria are also able to salvage these molecules directly from their environment when available. *P. aeruginosa* has 13 genes annotated as putative nucleobase transporters; however, these genes are poorly studied.

My current project aims to improve our understanding of nucleobase transporters and nucleobase salvage in *P. aeruginosa* using genetic and biochemical techniques. I hypothesize that salvage of nucleobase-related compounds may impact intracellular nucleotide pools, which may in turn alter bacterial behavior.

What attracted you to your program?

Getting the Word Out

Marla Paul is the Senior Health Sciences Editor for the Office of Global Marketing and Communications



Marla Paul is the senior health sciences editor for the Office of Global Marketing and Communications at Northwestern University where she promotes research at the Feinberg School of Medicine. Paul promotes newsworthy science by clinicians and scientists from Feinberg to media outlets including newspapers, television news, radio and digital publications.

Q&A

Where are you originally from?

I am from Chicago.

Please tell us about your professional background.

I've been the health sciences editor at Northwestern for 15 years. I am a former staff writer at the *Chicago Sun-Times* and was a freelance writer for the *Chicago Tribune* and various national magazines. I also wrote a book, "The Friendship Crisis."

How do you help scientists at the medical school?

I promote newsworthy research by scientists and physician-scientists at the medical school to the media including newspapers, TV news, radio and websites. It is usually based on a study that has been accepted by a journal.

There is a lot of important research happening at Feinberg, but since I work with media targeted to the general public the studies need to be relevant to the public. If a scientist has an upcoming study they think will make a media splash, I want to hear from them ([email Marla here](#)).

I also promote experts at Northwestern who can talk about subjects in the news. I also want to hear from people who have expertise and a point-of-view on breaking medical and health news.

What is your favorite part of the job?

I love meeting scientists and learning about their research. It fascinates me, and I am always learning. I feel like a kid in a candy store being surrounded by all this exciting research.

I also like the challenge of translating complicated research into a story the public can understand. It's fun to pitch a story to *The New York Times*, *The Wall Street Journal* or *NBC Nightly News* and then see it in the newspaper or on the news broadcast.

What exciting projects are you working on?

I'm working on several releases about upcoming clinical trials for COVID-19 treatments that were partly developed by Northwestern scientists. The research is so important and timely.

What do you like to do in your spare time?

I am learning to play drums and I upcycle vintage clothes that I have started to sell on Instagram. I also have an Instagram blog. You can follow me at [@rebellewithmarla](#).

Research in the News

Fox 32, October 3

[Northwestern study finds COVID-19 can cause heart failure in some patients](#)

Sadiya Khan, MD, MSc, was mentioned.

The New York Times, October 5

[Nearly One-Third of COVID-19 Patients in Study Had Altered Mental State](#)

Igor Koralnik, MD, was mentioned.

• This research was also featured in *Yahoo! News*, *The Chicago Tribune*, *The Washington Post*, *TODAY*, *Fox News* and others

The New York Times, October 8

[After a Hospital Stay for COVID, Patients May Face Months of Rehabilitation](#)

Colin Franz, MD, PhD, was mentioned.

U.S. News & World Report, October 7

[4 in 10 Teens, Young Adults Have Used CBD Oil, Study Finds](#)

Richard Miller, PhD, was mentioned.

Chicago Tribune, October 9

[Researchers Surprised: 20 Percent of Chicagoans in Blood-Test Study Came Up Positive for Coronavirus Antibodies](#)

Elizabeth McNally, MD, was mentioned.

WGN 9, October 14

[How long will immunity to COVID-19 last once a person is infected? Research offers promising news](#)

Thomas McDade, PhD, was mentioned.

Crain's Chicago Business, October 26

[Covid-19 Researchers Voice Concern for LGBTQ Health Risks](#)

Brian Mustanski, PhD, was mentioned.

U.S. News & World Report, October 22

[Tackling Dangerous Drug Shortages](#)

Karla Satchell, PhD, was mentioned.

NIH News

NIH Releases New Policy for Data Management and Sharing

Nearly 20 years after the publication of the NIH Statement on Sharing Research Data in 2003, NIH has now released the [Final NIH Policy for Data Management and Sharing](#). The policy requires NIH-funded institutions generating scientific data to plan for managing and sharing that data more broadly. The drafting of the policy, years in the making, was informed by feedback and input from stakeholders and aims to find balance between reasonable expectations for data sharing and flexibility to allow for diversity of data types and circumstances. “We hope it will be a critical step in moving towards a culture change, in which data management and sharing is seen as integral to the conduct of research. Responsible data management and sharing is good for science; it maximizes availability of data to the best and brightest minds, underlies reproducibility, honors the participation of human participants by ensuring their data is both protected and fully utilized and provides an element of transparency to ensure public trust and accountability,” writes NIH Associate Director for Science Policy Carrie Wolinetz, PhD, in a [blog post](#). The policy will go into effect in January 2023 to give the research enterprise time to accommodate new requirements.

Human Subjects’ Protection and Monitoring Plans on All About Grants Podcast

In a recent episode of [All About Grants](#) podcast, NIH’s Inclusion Policy Officer Dawn Corbett, MPH, shares why human subjects’ protection and monitoring plans are important. Corbett discusses what should be included in these plans as part of your application, what should be left out, what are risks and what are benefits to study participants, how reviewers assess it all and more. [Tune in here](#) or [read the transcript](#) to learn more.

ICYMI: NIH Virtual Seminar on Program Funding and Grants Administration Video and Resource Library Available Online

If you were unable to attend the [2020 NIH Virtual Seminar on Program Funding and Grants Administration](#), held from October 27 through October 30, or need to reference back to sessions or materials, the on-demand video library and downloadable resources are available on the [NIH Grants & Funding website](#). Additional session recordings are also available on the [NIH Grants YouTube channel](#).

NUCATS Corner

Clinical and Translational Sciences Institute



New Webpage Highlights NUCATS Navigator ‘Help Desk’

To better assist the research community with the NUCATS Institute’s resources and services, a new [Need Help?](#) page now provides access to expert advice and comprehensive support. The institute’s [Navigator Portal](#) has been redesigned to provide information on NUCATS membership, grant development and implementation Studio Consultations, letters of support, the Facilities and Other Resources document, and more.

NUCATS remains committed to providing Northwestern scientists with consultative resources and expertise in order to accelerate how quickly transformative scientific discoveries make their way to patients and the community. It is the institute’s goal to continually increase the quality, safety, efficiency and speed of innovative clinical and translational research.

COVID-19 Symposia set for November 19 to 20

The NUCATS Institute is hosting a two-day COVID-19 Symposia that will explore how multidisciplinary collaboration can advance scientific discovery. The event will feature four sessions over two days.

November 19 Sessions — 3:00 p.m. to 5:00 p.m.

- How COVID-19 Changed the Conduct of Clinical and Translational Research
- Rising to the Challenge through Innovative Diagnostics and Technologies

November 20 Sessions — 8:00 a.m. to 10:00 a.m.

- Systemic Inequality: Trust, Transparency, and Inclusion
- Therapeutics to Combat the Pandemic

Each session will feature a keynote speaker, five-minute lightning talks and small group discussions. A networking event to spur collaboration will occur at the conclusion of each day. Following the COVID-19 Symposia, there will be a competition for up to two \$25,000 grants intended to fund COVID-19 research conducted by new, interdisciplinary collaborations initiated through the symposia. [Learn more.](#)

Sponsored Research

PI: [Tanya Simuni, MD](#), the [Arthur C. Nielsen, Jr.](#), [Research Professor of Parkinson's Disease and Movement Disorders](#) and [director of the Parkinson's Disease and Movement Disorders Center](#)

Sponsor: [Michael J. Fox Foundation](#)

Title: [Continuation of the Parkinson's Progression Markers Initiative](#)



The Parkinson's Progression Markers Initiative ([PPMI](#)) aims to identify biomarkers for the progression of Parkinson's disease to be used in clinical trials for novel therapies.

Over the last decade, PPMI has created a longitudinal clinical and biomarker dataset involving more than 1,400 participants with idiopathic Parkinson's, individuals with genetic forms of Parkinson's, participants with early symptoms of the disease, as well as healthy controls. The project has also compiled standardized protocols for acquisition, transfer and analysis of clinical, imaging, genetic and biospecimen data that is available to use by the Parkinson's disease research community.

A number of diseases routinely use biomarkers in research and clinical practice, but Parkinson's, an increasingly common disease of aging, does not have such objective measures. PPMI data are essential to developing better tools to advance and accelerate novel therapies.

The grant will support efforts in recruiting and following study volunteers from diverse cohorts to gather valuable clinical and imaging data and biological samples. The study plans to enroll 4,000 participants who will be followed by investigators for five to eight years. Participants will include individuals recently diagnosed with Parkinson's disease, participants who carry Parkinson's-associated genetic mutations, individuals with clinical risk factors and healthy controls.

[Read more](#)

PI: [Yvonne Lee, MD, MMSc](#), [associate professor of Medicine in the Division of Rheumatology](#) and the [Department of Preventive Medicine](#)

Sponsor: [National Institute of Arthritis and Musculoskeletal and Skin Diseases](#)

Title: [CNS Pain Mechanisms in Early Rheumatoid Arthritis: Implications for the Acute to Chronic Pain Transition](#)



Millions of Americans spend each day in severe pain associated with arthritis. The longer the pain persists, the harder it is to treat. Efficacious prevention strategies are needed. A major barrier to chronic pain prevention is a gap in knowledge about how acute joint pain leads to changes in central nervous system (CNS) pathways responsible for sensing, transmitting and regulating pain. This process, which results in widespread pain sensitivity, is termed pain centralization.

The long-term goal of this research program is to design interventions to prevent pain centralization, and hence chronic pain, in rheumatoid arthritis (RA). The objective of this project is to identify modifiable clinical factors and neurobiological pathways that lead to the development of chronic pain in early RA. The focus of this project is early RA because the first 12 months after RA diagnosis represents a critical time to prevent the acute to chronic pain transition. Preliminary data from the Canadian Early Arthritis Cohort showed that the incidence of fibromyalgia, the prototypical centralized pain condition, is highest during the first year after RA diagnosis. The central hypothesis is that sleep problems, psychosocial factors and abnormal CNS (brain, spinal cord) regulatory mechanisms predict the development of pain centralization in the first year after RA diagnosis.

[Read more](#)

Revised Human Stem Cell Policy

In order to facilitate research with Human Stem Cells, the [Use of Human Stem Cell Policy](#) has been revised, and the Northwestern University Committee on Human Stem Cell Research (NUCHSR) has been re-established. The Northwestern Office for Research approved the policy revision and the Feinberg School of Medicine will administer the policy requirements.

The Use of Human Stem Cell Policy outlines the requirements for use and derivation of human stem cells and establishes a registration process for such cells. NUCHSR must review and approve the procurement, derivation, banking, distribution or use of human stem cells prior to their use in research.

For details on the Use of Human Stem Cell Policy and processes, please visit the Human Stem Cell Research [website](#) or contact the Feinberg Office for Regulatory Affairs at ora@northwestern.edu.

Funding

Growing Convergence Research

[More information](#)

Sponsor: National Science Foundation (NSF)

Submission Deadline: February 1, 2021

Upper Amount: \$3.6M

Synopsis: Growing Convergence Research (GCR) was one of 10 [Big Ideas](#) identified by NSF – long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering, which represent unique opportunities to position the nation in the cutting edge of global science and engineering leadership, by bringing together diverse disciplinary perspectives to support convergence research. Convergence research is a means for solving complex research problems, in particular, focusing on societal needs. It entails integrating knowledge, methods and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation. Multi-disciplinary team research that crosses directorate or division boundaries and is currently not supported by NSF programs, initiatives and research-focused Big Ideas are encouraged to apply. Proposers must make a convincing case that the proposed research is within NSF's purview and cannot be supported by existing NSF programs and multidisciplinary initiatives.

McKnight Endowment Fund for Neuroscience: Technology Awards

[More information](#)

Sponsor: McKnight Foundation

Letter of Intent Deadline: December 7

Submission Due: April 26, 2021

Amount: \$200K

Synopsis: This program supports scientists who work on novel and creative approaches to understanding brain function. The program seeks to advance and enlarge the range of technologies available to the neurosciences, but does not support research based primarily on existing techniques. The Endowment Fund is especially interested in how technology may be used or adapted to monitor, manipulate, analyze or model brain function at any level, from the molecular to the entire organism. Technology may take any form, from biochemical tools to instruments to software and mathematical approaches. Collaborative and cross-disciplinary applications are explicitly invited.

Clinic Testing Therapeutic/Indication Pairing Strategies (U01 Clinical Trial Required)

[More information](#)

Sponsor: National Center for Advancing Translational Sciences (NCATS)

Submission Deadline: [Standard dates](#)

Notice Expiration Date: March 6, 2021

Amount: \$3M

Synopsis: NCATS seeks applications for support of clinical studies to repurpose existing drugs or biologics (therapeutics) that have already completed at least a Phase I trial for a different indication by the time an award is granted. The hypothesis for proposed studies must be developed using innovative processes to identify the therapeutic/indication pair. Examples include independent crowdsourcing strategies or computational algorithms. Projects should be supported by scientific evidence that modulation of a therapeutic target will have a positive impact on the disease/condition.

[View COVID-19 funding opportunities](#)

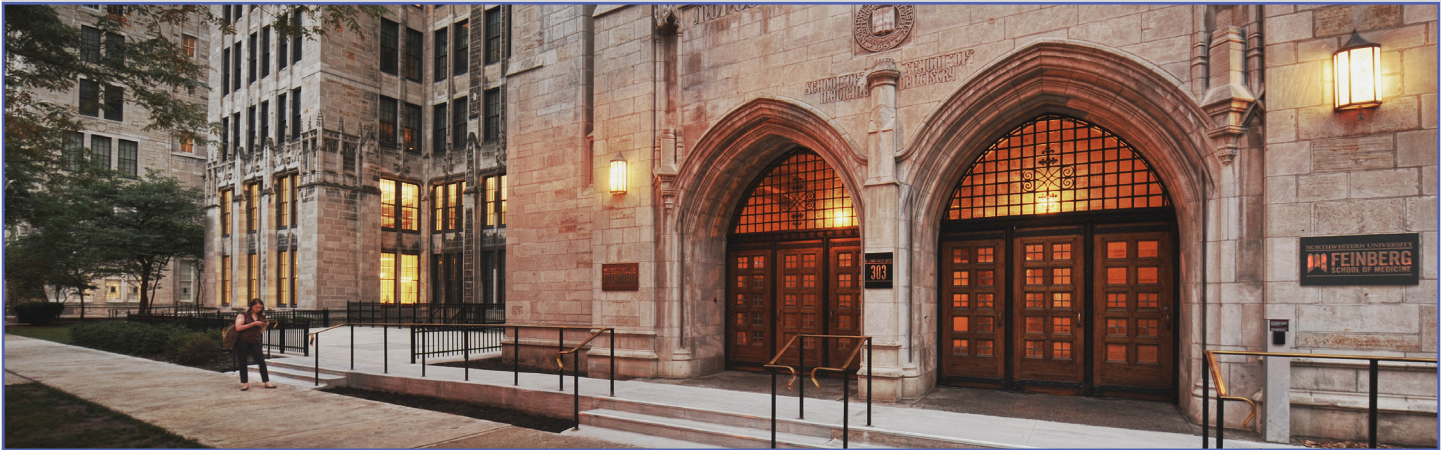
[View more funding opportunities](#)

Welcome New Faculty

[Mazhar Adli, PhD](#), joins as associate professor of [Obstetrics and Gynecology](#) in the [Division of Reproductive Science](#) in Medicine. His laboratory is focused on understanding the key drivers of cancer and identifying novel therapeutic drug combinations to prevent cancer development and chemotherapy resistance. His team uses and develops genomic and epigenomic mapping, editing and imaging to understand genome regulation in normal and malignant settings, with a particular expertise in utilizing and developing CRISPR-based technologies. Before joining Northwestern, Adli was associate professor of Biochemistry and Molecular Genetics at the University of Virginia School of Medicine. He earned his doctoral degree from the University of North Carolina at Chapel Hill and completed his postdoctoral training at Harvard Medical School, Massachusetts General Hospital and the Broad Institute of MIT and Harvard.



Systematic or Scoping Review: Choosing the Best Review for You



By Eileen Wafford, Research Librarian

You have a topic and are interested in conducting a literature review to learn more about it. While there are several review types to choose from, you have narrowed your choices to either a systematic or a scoping review. So, which review is right for your team? Systematic and scoping reviews appear similar on the surface. Both are comprehensive literature analyses with seemingly identical steps and documentation requirements. However, differences in the research questions, quantity of results, quality or risk of bias assessment, and reporting guidelines result in two distinct research designs.

Research question: Systematic reviews require a focused research query, and teams often employ the [PICO framework](#) to formulate a well-designed question. Though not required, ideally that question should be answerable with studies utilizing similar study designs, e.g., RCTs, as this makes quality assessment, risk of bias review, synthesis and comparison easier. Scoping reviews ask broader questions. PICO may not be an appropriate framework, so review teams can choose from [several frameworks](#) to construct their research question(s). The [Joanna Briggs Institute](#) recommends the PCC or Population, Concept, and Context method to frame a scoping review question. Scoping reviews often have sub-questions, which should fit under the main question defined by the chosen question framework. As scoping reviews are more likely to be charting or scoping the landscape of a topic, they can more easily accommodate different study designs in the synthesis.

Quantity: The broader questions and exploratory nature of scoping reviews often generate larger amounts of references to screen when compared to systematic reviews. A scoping review search strategy might be iterative, changing over time with further review of the scope, and so yielding more results. A systematic review applies a fixed search strategy developed prior to the conduct of the searches, which ensures that the results retrieval is more predictable.

Quality and risk of bias analysis: [Assessment of quality and risk of bias](#) for each included study is mandatory for systematic reviews. These analyses are optional for scoping reviews, which may be an advantage given the greater quantity of studies to screen and the likely different study designs included for a scoping review.

Reporting guidelines: Systematic and scoping reviews have distinct reporting guidelines. Systematic review teams should use the PRISMA checklist, established in 2009 and currently undergoing revisions, to write up their review. The PRISMA 2009 checklist contains 27 items, including several about quality and the risk of bias. Scoping review teams should consider using the [PRISMA-ScR](#) checklist. The PRISMA-ScR checklist has 22 items, two of which are optional items about bias or quality assessment.

Protocol: Regardless of the review type, all review teams should develop and register a [protocol](#). Systematic review teams should use the [PRISMA-P](#) checklist and consider registering their protocol on [PROSPERO](#). There are no guidelines for developing a protocol for a scoping review; however, teams can develop a protocol based on the title, introduction and method sections of the PRISMA ScR checklist. PROSPERO does not currently accept protocols for scoping reviews so teams can deposit and publish their protocol in a repository such as [DigitalHub](#).

Both systematic and scoping reviews are well-recognized vehicles for providing evidence syntheses, but your question and goals will determine which methodology is appropriate. Contact your Galter [liaison librarian](#) to learn more about systematic and scoping reviews or discover which one might work best for your project.

Further reading:

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Featured Core

The NUgene Project

The **NUgene Project**, sponsored by the [Center for Genetic Medicine](#) in partnership with [Northwestern Medicine](#), is a genomic biobank that stores DNA samples and longitudinal medical information from over 14,000 participating patients at Northwestern-affiliated outpatient clinics and hospitals. NUgene participants consent to genetic research on their DNA samples and health data. NUgene is an institutional resource providing investigators with coded DNA samples and data for genomics research, as well as a vehicle for participant recruitment and contact for secondary studies.

The top selected phenotypes for NUgene are lipid metabolism disorder, essential hypertension, gastroesophageal reflux disease, cardiac dysrhythmias, allergic rhinitis, depression, obesity, acquired hypothyroidism, diabetes mellitus, chronic sinusitis, coronary atherosclerosis, diverticulosis/diverticulitis, asthma and heart failure.

The NUgene Project can provide investigators with the following:

- Case and/or control DNA samples from the NUgene population for research
- Data, from both the electronic health record and a self-reported health history questionnaire, with or without accompanying DNA samples
- Genomic data on 6,000 participants
- Whole genome data on 1,200 participants
- Assistance with recruiting patients for inclusion in the NUgene Project
- Templated language about using NUgene samples to assist with IRB approval and/or grant submissions
- Access to NUgene participants for study-related questions or participation in other studies
- Grant application support (i.e. preliminary study feasibility assessments)
- IRB application consultation
- Study consultation
- Support for managing and storing biorepository DNA samples

Contact:

NUgene Project Director, Megan Roy-Puckelwartz, PhD
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nugene@northwestern.edu
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Location:

Arkes Pavilion, 676 N. St. Clair St., #1260

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