# Northwestern Medicine Tal 202

### **Balancing Act**

The delicate science of regulating inflammation offers a pathway to treating a range of diseases · p. 14

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#### Real World Exposure

As part of their recent Introduction to the Profession Module, first-year medical students had the opportunity to shadow Northwestern Memorial Hospital healthcare professionals for a week. The program, now in its ninth year, gives new medical students first-hand exposure to clinical settings while observing a variety of longserving medical staff. Here, students are learning from a staff member in a cardiac catheterization laboratory.

Photography by Laura Brown

Northwestern Medicine magazine is published quarterly for alumni and friends of Northwestern University Feinberg School of Medicine, Northwestern Memorial HealthCare, and the McGaw Medical Center of Northwestern <u>University.</u>

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macrophages in which the central macrophage is activated. Image: Science Source.

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#### LEADERSHIP

## **Focus on Faculty**



S THE WEATHER COOLS AND WE SETTLE INTO THE ACADEMIC year, many of us find comfort in the familiar rhythm that will follow in the months to come. Whether it is the students who just donned their white coats for the first time on Founders' Day, or those whose white coats have seen many years of wear, our community is ready to buckle in — ready to learn, to discover, to grow.

This magnificent ride would not be possible without our incredible faculty. Individually, their discoveries are gamechanging, their work lifesaving, their mentorship transformative. But as a connected network of collaborators, innovators, dreamers, and doers, their collective contribution to science, education, and medicine is simply staggering.

The school now counts 2,063 faculty in regular tracks: 1,616 clinician-educators, 372 investigators, and 75 team-scientists. Another 2,233 practice medicine, teach students, or conduct research in various contributing tracks.

One of the faculty's core functions is to educate and, when combining medical students, fellows, residents, and other trainees in the various top-tier programs we offer, that means educating more than 3,500 healthcare professionals and scientists of tomorrow. This is no small feat, and our faculty is more than meeting the challenge. Teaching evaluations are high and student outcomes excellent: Our medical students achieve United States Medical Licensing Examination scores well above the national mean, and the majority match into Top 25 institutions for residency. Last year's Association of American Medical Colleges Graduation Questionnaire, completed by medical students in the Class of 2021, reported 96 percent satisfaction with their education, putting us above the 80th percentile nationally.

There is yet more to commend, as our faculty members' work extends far beyond the classroom. Thanks to Feinberg's extraordinary roster of clinician-educators, team scientists, and investigators, in the past decade, our total research portfolio has grown 94 percent from \$315 million per year to \$610 million per year.

As I reflect on these astounding figures, I think of the steady build this sort of progress requires, and the rock-solid foundation our predecessors laid for us to be able to arrive at this point. In this issue, we honor a revered faculty member and leader dear to so many, who recently passed away: Lewis Landsberg, MD, whose endowed title I proudly carry. Here is a man who reflected every attribute to which we aspire as faculty and, moreover, as humans striving to make an impact on our world. Please read more about him, along with other cherished members of the Northwestern community who have passed, on page 36.

Also in this issue, you will once again find stories of our dedicated faculty, such as D. James Surmeier, PhD, chair and Nathan Smith Davis Professor of Neuroscience, who is the winner of the 2021 Tripartite Legacy Faculty Prize in Translational Science and Education. This honor is presented annually to a faculty member who has demonstrated excellence in research that emphasizes translational approaches, teaching and mentoring, and leadership — a trifecta of immense contribution.

You will also learn more about Kristi Holmes, PhD, director of the Galter Health Sciences Library, who has put Galter on the national and international stage for bioinformatics and data science, and William Muller, MD, PhD, the Janardan K. Reddy, MD Professor of Pathology, who for three decades has been tenaciously studying the body's inflammatory response as a pathway to treating disease.

Perhaps the most telling example of our exemplary faculty can be found on page 7, where you can read about the 23 faculty recently appointed with endowed professorships — the highest honor a university can bestow upon its faculty. The medical school currently has more than 200 endowed professorship positions, and we could not be prouder of these distinguished individuals.

Of course, the beauty of higher education is that it is a continuum, and everyone no matter where they are on their academic journey — is valued and valuable. Here's to the many working at every level and in various capacities to make our medical school extraordinary. Past, present, and future, the impact of our people is felt near and far.

With warm regards,

#### Eric G. Neilson, MD

Vice President for Medical Affairs Lewis Landsberg Dean



## Historic Gift Naming the Havey Institute for Global Health

orthwestern University Trustees and alumni Patrick G. Ryan and Shirley W. Ryan have made a historic gift to name and endow the Robert J. Havey, MD Institute for Global Health at Feinberg. The Ryans' gift will ensure that the institute has resources in perpetuity to improve the health of billions of people in low- and middle-income countries worldwide.

"It has been my great privilege to know Pat and Shirley over the years, and I am incredibly humbled and energized by their dedication to the institute's mission. With their investment, we have a foundation to expand our work in global health to find solutions to health issues that affect over half the world's population," said Robert J. Havey, '80 MD, '81, '83 GME, deputy director of the Havey Institute for Global Health, clinical professor of Medicine in the Division of General Internal Medicine and Geriatrics, and long-time general internist with Northwestern Medical Group.

The gift is part of a historic \$480 million gift, the largest in Northwestern's history. The Ryans' wide-ranging philanthropy has supported athletics, research, facilities, scholarships, fellowships, and professorships in addition to this new gift to global health. Mr. Ryan is the founder, chairman, and CEO of Ryan Specialty Group, founder and former CEO of Aon Corporation, and a widely respected entrepreneur and insurance leader. Mrs. Ryan is a national leader for early detection and intervention of movement, sensory, and communication problems in infants and children. Together, the Ryans co-founded Pathways. org, which merged into the Shirley Ryan AbilityLab, the No. 1 U.S. rehabilitation hospital for 21 consecutive years.

#### NEW FACULTY LEADERSHIP APPOINTMENTS



#### SACHIN PATEL, MD, PhD,

the James G. Blakemore Professor of Psychiatry and Behavioral Sciences and director of the Division of General Psychiatry at

Vanderbilt University Medical Center, has been named chair and Lizzie Gilman Professor of Psychiatry and Behavioral Services at Feinberg, and psychiatrist-in-chief at Northwestern Memorial Hospital's Norman and Ida Stone Institute of Psychiatry, effective January 2022.

An internationally recognized expert in the field of psychiatric neuroscience, Patel is a physician-scientist who combines a deep background in cellular, molecular, and behavioral neuroscience with clinical expertise in psychiatry and addiction medicine. He has published many peerreviewed papers, books, chapters, and review articles in journals including *Biological Psychiatry*, *Nature Neuroscience*, and *Neuron*, and amassed nearly 6,000 citations.



#### STEPHANIE EISENBARTH,

**MD, PhD**, the associate chair of research in the Department of Laboratory Medicine and assistant director of the Clinical Pathology Residency

Program at Yale University, has been named chief of Feinberg's Division of Allergy and Immunology in the Department of Medicine and director of the newly formed Center for Human Immunobiology, effective January 2022.

Eisenbarth is an internationally known immunologist whose research focuses on how dendritic cells, B-cells, and T-cells interact to induce antibody responses. Her work studying genetic factors in allergy and translational immunology has been published in many peer-reviewed papers, editorials, and review articles in journals including *Science*, *Nature*, *Journal of Allergy and Clinical Immunology, Immunity, Journal of Experimental Medicine*, and more.

#### **PULSE** *On Campus*

# **Celebrating** Founders' Day 2021

'm so proud to be wearing this white coat today," said Cheryl Mensah, a first-year medical student, at this year's Founders' Day celebration. "I feel very humbled — you grow up and see so many people who are important wearing this coat — and I'm hoping I can make a difference in patients' lives."

The annual Founders' Day ceremony this year welcomed first- and second-year medical students to campus. The celebration, held on August 6, honors Feinberg's founders and marks the official start of the academic year.

Mensah was one of 162 new members of the Class of 2025, who celebrated the occasion with their families, along with the second-year medical students who presented the incoming class with their white coats. Because last year's Founders' Day event was cancelled due to the COVID-19 pandemic, the Class of 2024 was also honored and given a chance to put on their white coats for the first time together.

"We are delighted to have so many family and friends here to welcome a talented group of new students who will help write the next chapter in the story of Feinberg," said Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean. "Founders' Day has been a tradition here at the medical school since 1922. It is the traditional start of our new academic year; it is also a new beginning for our students on a path that will lead them into careers of life-long responsibility."

Neilson highlighted Feinberg's distinguished history of training outstanding physicians, including Daniel Hale Williams, part of the Class of 1883, who performed the first successful pericardial repair in America and was the only Black charter member of the American College of Surgeons, Mary Harris Thompson, the first female graduate of Feinberg in 1870 and the first female surgeon in Chicago, and Charles Horace Mayo, who graduated in 1888 and returned to Minnesota to join his father and brother in founding the Mayo Clinic.

While academic and professional accomplishments are important, the heart of practicing medicine remains the same since Feinberg was founded in 1859: caring for patients.



"I feel very humbled – you grow up and see so many people who are important wearing this coat – and I'm hoping I can make a difference in patients' lives."

#### **CHERYL MENSAH**

A first-year medical student



"Tve wanted to be a doctor for as long as I can remember. I know we can do this if we do it together."

#### MAX WILBERDING

A first-year medical student

"An obligation to serve patients to the best of your ability, no matter the circumstance, is at the very core of our profession," Neilson said.

Kathleen Hagerty, PhD, MBA, provost of Northwestern University also welcomed the incoming class.

"During this era, against the backdrop of a global pandemic, we have witnessed the critical importance of scientific discovery and compassionate care, around the world, and here in Chicago," Hagerty said. "You have chosen the very best place to learn these critical aspects of medicine, as you embark on the next chapter of your educational journey."

The Founders' Day address was delivered by Dinee Simpson, MD, assistant professor of Surgery in the Division of Organ Transplantation and director of the African American Transplant Access Program (AATAP).

"You are in a position to influence so much more than the diagnosis and treatment plan," Simpson said. "The power of being seen speaks to the power of community, and your most powerful moments as physicians are not just as clinicians, but as representatives, advocates, and allies for our patients."

To close out the ceremony, Marianne Green, MD, the Raymond H. Curry, MD, Professor of Medical Education and vice dean for education, led the white coat ceremony for both secondand first-year students. Even though second-year students had been wearing their coats for a year, the moment was nevertheless impactful, according to Alan Soetikno, a second-year student.

"Our first year of medical school was tough because of COVID," Soetikno said. "But putting on the coats together, that was a special feeling."

Next, the first-year students donned their white coats, a lifelong dream for students including Max Wilberding, a first-year student from a suburb of Cincinnati, Ohio.

"I've wanted to be a doctor as long as I can remember," said Wilberding. "I saw all the faculty, family, and fellow students cheering us on - I know we can do this if we do it together."

Clad in white, the first-year students recited the Declaration of Geneva, the modern incarnation of the historic Hippocratic Oath. The oath, representing a lifelong commitment to caring for others, was a surreal experience for Luis Rivas, a first-year student from Chicago who has spent the last four years working as an emergency medical technician and teaching with Teach For America.

"There were times when I thought maybe I wasn't cut out for medicine," Rivas said. "But when I put on the coat and recited the oath, it made me realize that I'm here. I'm getting another chance to stretch my wings, explore academic medicine, and become a physician."



# **Cultivating Rising Talent**

*Physician-scientists receive career development award to pursue their research.* 

hysician-scientists at the beginning of their research careers often face a predicament: Securing grants to conduct research requires research experience and mentorship. The Northwestern University Clinical and Translational Sciences (NUCATS) Institute KL2 program exists to help resolve this.

Over the next two years, the 2021 cohort of KL2 scholars — Kyle MacQuarrie, MD, PhD, instructor of Pediatrics; Colleen Peyton, DPT, assistant professor of Physical Therapy and Human Movement Sciences and Pediatrics, and Anna Pfenniger, MD, PhD, instructor of Medicine in the Division of Cardiology — will receive the necessary mentorship, education, and career development opportunities to jumpstart their research careers.

"I was so excited when I got notice that I had been awarded the KL2 because I think that there is a bottleneck in developing physician scientists. We certainly see that in pediatrics, which is my specialty," said MacQuarrie, who is conducting research on the pediatric cancer rhabdomyosarcoma. Peyton began her career as a physical therapist who didn't anticipate getting involved in research. Her KL2 project centers on studying the motor behavior of preterm infants with brain injury.

"My path to an academic career is less traditional because I began as a clinician and became interested in research over time," Peyton said. "The KL2 is a wonderful opportunity for me because now I can ask more informed questions and focus my studies by applying the experiences I have learned in my clinical career."

Pfenniger realized her fascination with cardiology when she was in medical school at the University of Geneva in Switzerland. She seeks to learn more about the role of abnormal small blood vessels, called endothelial dysfunction, in atrial fibrillation.

"As a cardiac electrophysiologist, taking care of patients with atrial fibrillation, I am confronted by the limitations of our treatments for this disease every day," Pfenniger said. "I am also reminded daily that we don't know



From left to right: Kyle MacQuarrie, MD, PhD, Colleen Peyton, DPT, and Anna Pfenniger, MD

a lot about this disease, even though it is so common. My PhD focused on how blood vessels work, so this combines my prior expertise with my current clinical interests."



#### FIVE-YEAR, \$7 MILLION TRANSATLANTIC NETWORKS OF EXCELLENCE PROGRAM AWARD

An international collaboration for which Luisa Iruela-Arispe, PhD, the Stephen Walter Ranson Professor of Cell Biology and chair of Cell and Developmental Biology, serves as North American coordinator, has received a five-year, \$7 million Transatlantic Networks of Excellence Program award from the Leducq Foundation. The Leducq Foundation was founded in 1996 to support international, collaborative research in cardiovascular and neurovascular disease with an emphasis on the training of early-career scientists.

"Our objective is to capture raw talent — up-and-coming bright investigators — and cultivate their scientific interests towards solving problems related to vascular malformations," Arispe said.

# Honoring Faculty Excellence

23 exemplary faculty members were recently appointed with endowed professorships.



n September 20, 2021, Feinberg celebrated 23 faculty recently appointed with endowed professorships during a group investiture ceremony at The Peninsula Hotel in downtown Chicago.

Professorships represent the highest honor a university can bestow upon its faculty. These academic accolades help Feinberg recognize its most distinguished and productive physicians and scientists and continue to recruit and retain leaders in medicine. The medical school currently has more than 200 endowed professorship positions.

"At Feinberg, our faculty are the single most important resource for advancing the medical school's research, education, and clinical service," said Eric G. Neilson, MD, vice president for medical affairs and Lewis Landsberg Dean, during his opening remarks. "Our shared success depends on the intellectual environment created by a superb and committed faculty. For this reason, the creation of named and endowed professorships at the medical school is enormously important."

All of the medical school's 23 new professorships were created from donor funds. Endowments established by committed philanthropists create reliable, long-term support for faculty to initiate pioneering research, develop stronger teaching programs, invest in new technologies, and maintain laboratories and other physical assets.

"Thanks to generous medical school donors who support endowed professorships, our numbers continue to grow, aiding us in our endeavors to double Feinberg's research enterprise and continue our trajectory to the very top of academic medicine," Neilson said.

Several of the faculty members honored at the event were appointed to their professorships in late 2019 and 2020, but their celebrations were put on hold due to the COVID-19 pandemic.

#### HONOREES

Listed in alphabetical order

#### Hasan B. Alam, MD

Loyal and Edith Davis Professor of Surgery

**Luisa Iruela-Arispe, PhD** Stephen Walter Ranson Professor of Cell Biology

#### Brenda L. Bohnsack, MD, PhD

Lillian Sherman Cowen Reiger and Harold L.S. Cowen Research Professor of Pediatric Ophthalmology

Debabrata Chakravarti, PhD

Anna Lapham Professor of Obstetrics and Gynecology

**Elizabeth A. Eklund, MD** Johanna Dobe Professor of Hematology and Oncology

**Amy B. Heimberger, MD** Jean Malnati Miller Professor of Brain Tumor Research

Karen J. Ho, MD John Marquardt Clinical Research Professor of Vascular Surgery

**Tamara Isakova, MD, MMSc** Margaret Gray Morton Professor of Medicine

Emily S. Jungheim, MD, MSCI Edmond Confino, MD Professor of Obstetrics and Gynecology

Daniel Kim, PhD Knight Family Professor of Cardiac Imaging

**Igor J. Koralnik, MD** Archibald Church Professor of Neurology

**Lee Ann Lindquist, MD, MPH, MBA** George M. Eisenberg Research Professor of Geriatric Medicine

**Rukhsana G. Mirza, MD** Ryan-Pusateri Professor of Ophthalmology

**William A. Muller, MD, PhD** Janardan K. Reddy, MD Professor of Pathology

Kevin J. O'Leary, MD, MS John T. Clarke Professor of Medicine

Seth M. Pollack, MD Steven T. Rosen, MD Professor of Cancer Biology

**Brian J. Popko, PhD** William Frederick Windle Professor of Neurology

**Murali Prakriya, PhD** Magerstadt Professor of Pharmacology

**Gregory W. Schwartz, PhD** Derrick T. Vail Professor of Ophthalmology

Farzaneh A. Sorond, MD, PhD Dean Richard H. Young and Ellen Stearns Young Professor

**Michael S. Wolf, PhD, MPH** James R. Webster, Jr., Professor of Medicine

**Rui Yi, PhD** Paul E. Steiner Research Professor of Pathology

Feng Yue, PhD Duane and Susan Burnham Professor of Molecular Medicine

## **RESEARCH BRIEFS**

**DISEASE DISCOVERIES** 

PULSE

#### GENE IMPLICATED IN POOR SKIN CANCER THERAPY OUTCOMES

Immunohistochemistry staining showing PD1 expression on tumor cells in a skin biopsy from a cutaneous T-cell lymphoma patient.



Whole-genome sequencing analysis of cutaneous T-cell lymphomas has revealed that deletions of the gene PD1 were

associated with worse prognoses, according to a recent Northwestern Medicine study published in *Blood*. Normally, PD1 codes for a receptor that acts as a check on T-cell activity to prevent over-activity and autoimmunity. Some immunotherapies suppress the PD1 receptor to unleash the body's immune system against cancer, but this study demonstrates that cutaneous T-cell lymphomas (CTCLs) may be a poor candidate for this type of immunotherapy, according to Jaehyuk Choi, MD, PhD, the Ruth K. Freinkel, MD, research professor and senior author of the study.

The study used more than 300 samples of CTCL from a diverse array of patients, including different subtypes, stages and outcomes. Using unbiased whole genome sequencing, the investigators found 86 putative driver genes and unexpectedly, one gene had a much stronger association with worse outcomes than the rest: PD1.

"We thought each gene would subtly be a driver of disease phenotype, so we were shocked when one gene seemed to explain the difference between very aggressive and lessaggressive cancer," Choi said.

While the exact mechanism requires further study, Choi said this phenomenon made sense: In other cancers, suppressing PD1 helps recruit more T-cells to fight cancer. But when the cancer arises from T-cells — as is the case in CTCL — shutting down a vital check on T-cell recruitment can fuel the cancer further.

#### **DISEASE DISCOVERIES**

## New Hope for Antibody to Treat Muscular Dystrophy



Northwestern Medicine scientists have developed an antibody that they believe can be used to treat muscular dystrophy,

according to a study published in *Science Translational Medicine*.

"We believe this can become a therapy for muscular dystrophy, including the many different forms of muscular dystrophy," said senior study author Elizabeth McNally, MD, PhD, director of the Center for Genetic Medicine and the Elizabeth J. Ward Professor of Genetic Medicine. "Given the success with so many other antibodies in treating chronic human diseases like rheumatoid arthritis and psoriasis, we are very optimistic this antibody can translate into the human disease setting."

The antibody targets the TGF-beta pathway, a pathway known to be important for

regulating scarring (fibrosis). In muscular dystrophy, the muscles become scarred over time, and this antibody helps reduce scarring in the muscles. With this treatment the muscles also became stronger.

The target protein in this case binds the three major forms of TGF-beta, which makes it more effective than other approaches that target single forms of TGFbeta. Many scientists have tried to target TGF-beta to treat disease, but it has been difficult to do this successfully because of the multiple forms and their complicated pathway of action. The team made an antibody to the protein that binds all three forms of TGF-beta and stabilizes these proteins so they cannot become active. Too much TGF-beta activity is a major contributor to scarring and muscle weakness in muscular dystrophy.



The work was supported by National Institutes of Health grants HL140938, AR052646, DK121875, AR073655, HL141698, and Parent Project Muscular Dystrophy, the Muscular Dystrophy Association, Department of Defense grant W81XWH-17-DMDRP-IIRA and a sponsored research agreement from Solid Biosciences to Northwestern University.

This study was supported by National Institutes of Health grants (K08-CA191019-01A1,1DP2A1136599-01, T32 CA009560, K08 AR072791 and P30 AR070253, the Skin Cancer Foundation, the Leukemia Research Foundation, the Doris Duke Chartable Foundation, Damon Runyon Foundation grants DRCRF# 01-84-16, DDCF# 2016095 and DDCF CRM Award, and research grants from the Deutsche Forschungsgemeinschaft.



#### CLINICAL BREAKTHROUGHS

## **Combination Treatment May Prolong HIV Viral Suppression**



A novel combination treatment may increase the ability of monoclonal antibodies to control viral

infection in patients diagnosed with HIV, according to a Northwestern Medicine study published in *Science Translational Medicine*.

"This really demonstrates that we should combine broadly neutralizing antibodies with other immunostimulatory agents, especially those that may impact immune response. If we want to use broadly neutralizing antibodies to cure, we need to find the right combination," said Elena Martinelli, PhD, MPH, research professor of Cell and Developmental Biology and senior author of the study.

Neutralizing antibodies, a key component of the body's adaptive immune response in fighting against viruses and other pathogens, bind to the surface of infected cells and inhibit them from interacting with and infecting healthy host cells. Previous research has shown that these broadly neutralizing antibodies can promote the body's immune response, specifically by increasing T-cell and antibody responses in patients diagnosed with HIV.

Additionally, past research efforts led by Martinelli discovered that cells

#### "THIS REALLY DEMONSTRATES THAT WE SHOULD COMBINE BROADLY NEUTRALIZING ANTIBODIES WITH OTHER IMMUNOSTIMULATORY AGENTS, ESPECIALLY THOSE THAT MAY IMPACT IMMUNE RESPONSE."

that express the cellular receptor Integrin alpha 4 beta 7 are more commonly infected by HIV and promote pathogenesis. Understanding exactly how an individual's immune response reacts in the presence of neutralizing antibodies is essential to developing novel therapeutic interventions for treating HIV, according to Martinelli.

This work was supported by the National Institute of Allergy and Infectious Diseases grant R01AI098546-06.

#### SCIENTIFIC ADVANCES

#### INVESTIGATING LONG-LIVED MITOCHONDRIAL PROTEINS



Northwestern Medicine investigators have discovered that a subset of proteins in mitochondria of brain and heart cells are long-lived, supporting a stability of mitochondrial complex

the long-term stability of mitochondrial complex architecture.

The study, published in the *Journal of Cell Biology*, was led by Jeffrey Savas, PhD, assistant professor in the Ken & Ruth Davee Department of Neurology's Division of Behavioral Neurology, of Medicine the in Division of Nephrology and Hypertension, and of Pharmacology.

Previous work led by Savas discovered that nuclear pore complex proteins in post-mitotic

neurons are exceptionally longlived and persist for months in mouse and rat brains. These proteins, termed long-lived proteins, or LLPs, provide long-term stability and structure to the nuclear pore and subsequently to the nuclear envelope of neurons; however, this concept had never been considered



concept had never been considered for other intracellular organelles, until now. For example, proper functioning of mitochondria – organelles responsible for energy pro-

chondria — organelles responsible for energy production within the cell — was previously thought to rely on protein renewal. However, in the current study, the scientists used isotope labeling and mass spectrometry to discover that a subset of mitochondrial proteins were long-lived in tissues enriched in post-mitotic cells, including brain and heart cells. These proteins concentrated in a sub-compartment of mitochondria called cristae, highly structured folds within the mitochondrial inner membrane that are essential for cellular respiration and homeostasis.

"The identification of long-lived proteins in mitochondria is important and quite unexpected, as it counteracts the central idea of mitochondria being these dynamic organelles that are constantly being turned over and replaced," Savas said.

This work was supported by National Institute of Neurological Disorders and Stroke grant F32 NS106812 and R21NS107761, National Institute of Child Health and Human Development grant R21HD098498, and National Institute of Aging grant R01AG061787.

PULSE

#### SCIENTIFIC ADVANCES

#### STRENGTHENED MICROTUBULES AID CELL MIGRATION



Migrating cells use stiffened microtubules to push through tissue barriers, seeking out weak points in tissue, according to a Northwestern

Medicine study published in *Cell Reports*.

These findings shed light on the specific role of microtubules in cell migration, according to Brian Mitchell, PhD, associate professor of Cell and Developmental Biology and senior author of the study.

> "Microtubules are very dynamic, constantly growing and shrinking, but this process stabilizes them so they're more resistant to strain and gives cells the strength to poke through tissue," said Mitchell, who is also a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

Cell migration is fundamental to maintaining the proper organization of cells within the body. During development, large-scale migrations help build the central nervous system. In adult organisms, cell migration is essential for immune response, wound repair and tissue homeostasis.

Previous studies have outlined microtubules' role in aiding cell migration, according to Mitchell. In the current study, Mitchell and his collaborators measured the penetrative ability of cells in which they both positively and negatively modulated tubulin acetylation, finding that cells with more acetylation improved their ability to penetrate tissue. Cells with more acetylated microtubules are both faster at penetrating through the tissue and less picky about where they penetrate, according to Mitchell.

This work was supported by National Institute of General Medical Sciences grant R01GM119322.

#### **CLINICAL BREAKTHROUGHS**

## Supporting Women with Early Nonviable Pregnancies

Women with early, nonviable pregnancies of unknown location who were given an active management strategy had more

successful pregnancy resolutions than those given an expectant management strategy, according to a recent clinical trial published in *JAMA*.

The findings provide essential data for fertility clinicians to better guide their patients when making informed choices about their pregnancies, according to Emily Jungheim, MD, the Edmond Confino, MD, Professor of Obstetrics and Gynecology and a co-author

WOMEN WHO RECEIVED ACTIVE MANAGEMENT MORE FREQUENTLY EXPERIENCED A SUCCESSFUL RESOLUTION OF THEIR PREGNANCY. of the study. "When it comes to pregnancy and women's health, we really are trying to get to a place where we can be more patient-centered, and I think this particular study is in that spirit. It provides us more information to help educate our patients when they're faced with these tough decisions of what makes the most sense for them," said Jungheim, who is also chief of Reproductive Endocrinology and Infertility in the Department of Obstetrics and Gynecology and a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

Overall, women who received active management compared to those who received expectant management more frequently experienced a successful resolution of their pregnancy, with 51 percent versus 36 percent, respectively. The study demonstrates a shift in reproductive medicine becoming more patient-centered, according to Jungheim, adding that the present data will be essential for healthcare providers to better educate and guide patients.

This work was supported by the National Institutes of Health Eunice Kennedy Shriver National Institute of Child Health and Human Development.



**CLINICAL BREAKTHROUGHS** 

#### BLACK AND MEXICAN AMERICAN ADULTS DEVELOP DIABETES AT A YOUNGER AGE



Certain racial and ethnic minorities develop type 2 diabetes at a younger age than white Americans, meaning

current diabetes screening and prevention practices for them may be inadequate and inequitable, according to a recent Northwestern Medicine study published in *JAMA Internal Medicine*.

American adults are diagnosed with type 2 diabetes at an average age of 50 years old, but the 3,022-participant study found the average age at diagnosis was four to seven years earlier in non-Hispanic Black and Mexican American adults compared with non-Hispanic white adults. More than 25 percent of non-Hispanic Black and Mexican American adults with diabetes reported a diagnosis before turning 40.

Knowing when certain populations typically get diagnosed with a disease can help inform when doctors start screening to implement treatments that can slow or stop progression of the disease. Those screenings are covered under insurance plans when they are recommended by the U.S. Preventive Services Task Force (USPSTF), the national independent panel of experts that systematically reviews evidence to develop recommendations for clinical preventive services.

"The earlier you can screen, the better, but the biggest barrier to screening is the tradeoff for cost and benefit. Screening too early when a disease is not prevalent is not cost effective," said corresponding author Sadiya Khan, MD, assistant professor of Medicine and of Preventive Medicine. "The earlier you identify disease can make screening have the most impact when intervention may have greater benefit. Not doing so may contribute to substantial disparities in diabetes outcomes."

The study was funded by the National Institutes of Health (grant numbers P30AG059988 and P30DK092939) and the American Hear Association (grant number 19TPA34890060).



#### SCIENTIFIC ADVANCES

### **Transcription Elongation Checkpoint Discovered**



Northwestern Medicine scientists have identified a critical checkpoint in transcription elongation, the process of synthesizing RNA

from a DNA template, according to findings published in *Molecular Cell*.

According to the study, the presence of a protein called SPT5 serves as a "passport," determining whether a polymerase complex is allowed to proceed down the length of DNA or is instead degraded and destroyed.

"Only RNA Polymerase IIs with SPT5 are allowed to leave the station," said Ali Shilatifard, PhD, the Robert Francis Furchgott Professor, chair of Biochemistry and Molecular Genetics, and senior author of the study. Many molecular biology experiments operate by deleting a gene, or the protein that gene codes for, and observing the impact, which suggests the function of that gene. However, these methods often produce other mutations or require waiting as long as 72 hours before observation, allowing for other transcription processes to occur.

"By that point, you are reporting on the quaternary effect of the knockdown," said Shilatifard, who is also a professor of Pediatrics, director of the Simpson a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University. The new experimental method, called auxininducible degradation, allows immediate observation of the effects of protein depletion. In the study, investigators used this method to interrogate the role of the protein SPT5 in transcription elongation.

Querrey Institute for Epigenetics, and

This study was supported by the JSPS Research Fellowship for Young Scientists, the Uehara Memorial Foundation Research Fellowship, and National Institutes of Health grants R01CA214035, and National Cancer Institute grants CCSG P30 CA060553, S100D025194 and P41 GM108569.

#### PULSE 🔪 🕐

# **MEDIA SPOTLIGHT**

#### obe NEWS

#### Few People Medically Exempt from Getting COVID-19 Vaccine: Experts

Jeff Linder, MD, chief of General Internal Medicine and Geriatrics in the Department of Medicine, told ABC News that research so far shows that those who have a severe allergic reaction are likely triggered by polyethylene glycol (PEG), a component in the vaccines.

"An allergy to that is pretty rare," he told ABC News. "It would have to be documented, as a moderate or severe allergy, before I would consider giving a medical exemption."

According to the CDC, the COVID-19 vaccines are overall safe for people with "moderate to severe immune compromise" and underlying conditions, pregnant women, women trying to get pregnant, and breastfeeding mothers.

Linder said these populations are most vulnerable to severe illness and death from the coronavirus and it is important that they get their shot.

"Anyone who says, 'I have a medical condition,' that is more of a reason to get vaccinated," he said.

#### The New Hork Eimes

#### Pioneering Gene Therapy For Sickle Cell. Is a Cure at Hand?

Braxton Hubbard of Evanston, Illinois, began a treatment for sickle cell anemia while at Northwestern Medicine on July 6 at age 27. In January, his physician, Alexis Thompson, MD, professor of Pediatrics in the Division of Hematology, Oncology, and Stem Cell Transplantation, told him he no longer had sickle cell disease.

It is strange, Hubbard said, to think he has a future. "I am becoming more serious about life," he told *The NewYork Times*. "I didn't think I would have a life." Hubbard was treated with a treatment from Bluebird Bio.



npr

#### Fertility Clinics Shut Down During the Pandemic. Now, New Patients Are Rushing In.

During the early days of the pandemic, the American Society for Reproductive Medicine sent out guidance to all clinics and hospitals to pause fertility treatments indefinitely. Fertility clinics weren't considered essential, and their services were shut down for months.

Speaking to NPR, Kara Goldman, MD, associate professor of Obstetrics and Gynecology in the Division of Reproductive Endocrinology and Infertility, questioned why fertility treatment wasn't deemed essential during the pandemic, given the number of women it affects. "I think that there's always this misconception that infertility somehow is a luxury, like to be treated for infertility is a luxury," Goldman told the Chicago affiliate. "Infertility is a disease. It does not discriminate. Infertility care is essential. And it's never elective."

Now, according to the report, fertility clinics have reopened and are experiencing a rush of patients. Demand is high, leaving doctors to treat old patients and long lists of new ones.

#### Los Angeles Times

#### What Is the C.1.2 Coronavirus Variant – and Should We Be Worried?

C.1.2 has made its way from Africa to Asia, Oceania and Europe. Scientists have spotted it in Botswana, Mauritius, China, New Zealand, Portugal, Switzerland, and the United Kingdom. *The Los Angeles Times* posed the question: Will the United States be next? Should we be worried?

Experts say the emergence of a new variant doesn't necessarily spell imminent doom. Right now, Delta is the much bigger

concern — and, as the dominant strain here in the U.S., the variant to beat.

The bigger worry, according to Ramón Lorenzo Redondo, PhD, research assistant professor of Medicine in the Division of Infectious Diseases, is this: That more dangerous variants will crop up as infections continue to spread through vulnerable, unvaccinated populations.

"This is a global war right now," he said.

## **FACULTY AWARDS & HONORS**













#### Amy Heimberger, MD,

the Jean Malnati Miller Professor of Brain Tumor Research, was named by President Biden to the National Cancer Advisory Board, which plays an important role in guiding the director of the National Cancer Institute in setting the course for the national cancer research program.

#### D. James Surmeier,

PhD, chair of the Department of Neuroscience and Nathan Smith Davis Professor of Neuroscience, has been named the winner of the 2021 Tripartite Legacy Faculty Prize in Translational Science and Education. Read more about his work on page 18.

#### Joshua Rosenow,

MD, professor of Neurological Surgery in the Ken and Ruth Davee Department of Neurology and of Physical Medicine and Rehabilitation, was named a "Top Doc" by *Chicago* magazine.

Arthur Prindle, PhD, assistant professor of Biochemistry and Molecular Genetics, has been honored with the Early Career Award for Scientists and Engineers from the U.S. Army Research Office.

#### Donna Woods, EdM, PhD, pro-

fessor of Pediatrics, has received the AcademyHealth Child Health Services Research Lifetime Achievement Award.

#### Chad Mirkin, PhD,

the George B. Rathmann Professor of Chemistry and professor of Medicine in the Division of Hematology and Oncology, has received the Royal Society of Chemistry's de Gennes Prize. 101

The following Feinberg faculty have been selected for the second cohort of the Northwestern Pepper Scholars program, a three-year program aimed at training future leaders in geriatrics: • Whitney Welch, PhD, research assistant professor of Preventive Medicine in the Division of Behavioral Medicine

#### • Emma Barber, MD,

'14 GME, assistant professor of Obstetrics and Gynecology in the Division of Gynecologic Oncology 0 3

#### • Marquita Lewis-Thames, PhD,

research assistant professor of Medical Social Sciences 🔯 4

#### • Mary Clare Masters, MD, '20 GME, '20 MS, instructor of Medicine

in the Division of Infectious Diseases

#### Robert L. Murphy, MD,

'81, '84 GME, executive director of the Robert J. Havey, MD Institute for Global Health, the John Philip Phair Professor of Infectious Diseases, and professor of Biomedical Engineering was selected as a recipient of Feinberg's 2021 Faculty Mentor of the Year Award. Mentees highlighted Murphy's sense of academic social responsibility and cross-disciplinary collaborations. The Faculty Mentor of the Year Award is awarded by the Medical Faculty Council.

#### David Palmer, MD,

clinical associate professor of Ophthalmology, authored a resolution for the Chicago Medical Society stipulating that topical medications ordered at least 24 or more hours pre-op and used for surgeries in the OR must be properly labeled to provide to patients postdischarge if needed for continued care. The resolution was adopted by the Illinois State Medical Society resulting in the introduction and subsequent signing into law of Illinois SB-579. 🙆 5

#### Margaret Flanagan,

MD, assistant professor of Pathology in the Divisions of Experimental Pathology and Neuropathology and Neuropathology Core Leader of the Mesulam Center for Cognitive Neurology and Alzheimer's Disease, has received the inaugural Mark Rogovin Pilot Research Award in Neuroscience from the Northwestern University Clinical and Translational Sciences (NUCATS) Institute.

#### Adam Booth, MD,

assistant professor of Pathology in the Division of Gastrointestinal Pathology, and **Carla Ellis, MD, MS, (10**7), director of Renal

Pathology and associate professor of Pathology in the Division of Renal Pathology and of Genitourinary Pathology, were among those named in "2021 Power List" in The Pathologist.

#### Yvette Wong, PhD,

assistant professor of Neurology in the Division of Movement Disorders, was awarded a New Innovator Award from the National Institutes of Health (NIH). The award supports unusually innovative research from early career investigators who are within 10 years of their final degree or clinical residency and have not yet received a research project grant or equivalent NIH grant.

#### **Deborah Clements**,

MD, chair of the Department of Family and Community Medicine, the Nancy and Warren **Furey Professor** of Community Medicine, and professor of Family and **Community Medicine** and of Medical Education, received the Illinois Academy of Family Physicians **Distinguished Service** Award.

#### George Chiampas, DO,

assistant professor Emergency Medicine and of Orthopaedic Surgery, was awarded the Mayor Daley Award by the Chicago Police Department. He serves as EMS director for the Chicago Police Department.

MAGAZINE.NM.ORG 13

WRITTEN BY MELISSA ROHMAN

# **Balancing Act**

Feinberg scientists are investigating how regulating inflammation can be a pathway to treating a range of diseases.

ot all inflammation is created equal. While acute inflammation has evolved as the immune system's first response to protect the body, chronic inflammation can cause extensive and potentially irreversible damage, as commonly seen in autoimmune diseases or chronic inflammatory diseases like inflammatory bowel disease and atherosclerosis. Regulating inflammation — ensuring that the body doesn't generate too much of a good thing — is a flourishing area of study at Northwestern.

Perhaps one of the biggest hubs of activity in this area is the lab of William Muller, MD, PhD, the Janardan K. Reddy, MD Professor of Pathology. Muller has been studying the cellular and molecular mechanisms of the body's inflammatory response in the hope of discovering a more selective approach to treat disease for more than three decades. His lab's inflammatory models include atherosclerosis, myocardial infarction, dermatitis, and more.

"Simply put, inflammation is at the root of all pathology," he argues. "Once I realized that chronic inflammation becomes the disease instead of the way to eliminate the disease, I thought it was essential to learn how to regulate inflammation."

While Muller has studied a broad scope of diseases over the course of his long career, investigators across specialties are chasing the same culprit, studying its effects in diseases ranging from cardio-vascular disease and multiple sclerosis (MS) to rheumatoid arthritis and Alzheimer's disease. Recent high-impact publications demonstrate just how extensively Feinberg scientists have probed this critical factor in disease — and the translational potential their findings hold.

The Muller lab uses four-dimensional intravital confocal microscopy to study transendothelial migration at high resolution in real time in living animals. Here, Muller (far right), graduate student Maureen Hayes (left), and David Sullivan, PhD, research associate professor of Pathology, review data from a recent experiment.

#### THE "POINT OF NO RETURN"

The inflammatory response is a sequential process. When tissue is damaged, specialized immune cells already deployed throughout the body detect certain chemicals associated with invasive pathogens as well as damaged or dead cells. These immune cells then dispatch white blood cells, or leukocytes, and other molecular mediators to destroy any remaining pathogens, repair damage, and restore the body's homeostasis.

Eventually, leukocytes will interact with endothelial cells and move from the blood into the tissue through a process called transendothelial migration, or diapedesis. The phases leading up to diapedesis are reversible. Diapedesis and the phases that follow are not.

Diapedesis, which Muller refers to as the "point of no return," is therefore an attractive therapeutic target for regulating inflammation and potentially treating chronic inflammatory diseases. Regulating inflammation, however, is a balancing act: The goal is to treat chronic inflammation without eliminating a patient's entire inflammatory response and rendering them immunocompromised, according to Muller.

"This is the balance we're trying to strike now: How do we treat someone's arthritic fingers or their inflammatory bowel disease or their atherosclerosis without rendering them incapable of fighting off infections or healing skin wounds," Muller says.

In a recent study published in the *Journal of Experimental Medicine*, Muller's laboratory discovered that during transmigration, there is a transient increase in endothelial cell calcium ions that are spatially and temporally restricted to the site of diapedesis. The role of the calcium is to activate two key calcium signaling proteins: endothelial calmodulin (CaM) and endothelial calcium/calmodulin kinase II Delta (CaMKII Delta). CaMKII Delta activity is essential for endothelial membrane movement that promotes the transmigration process.

Current anti-inflammatory therapies work by blocking inflammation entirely throughout the body, commonly causing harmful side effects for patients. The findings from the calcium signaling study provide the impetus for regulating inflammation by selectively targeting endothelial cells to decrease the number of white blood cells passing across the endothelial cell wall without interfering with other immune functions, according to Muller.

Additionally, his team is beginning to investigate whether diapedesis is regulated similarly across all organs and tissues, specifically in the lungs and brain.

#### LINKS TO ABNORMAL HEART FUNCTION

One part of the body where inflammation wreaks the most havoc is in the heart. Heart failure is one of the leading causes of morbidity and mortality in the United States. A significant





Muller's lab recently demonstrated that calcium flux in endothelial cells is tightly coupled temporally and spatially with leukocyte transmigration. The arrows depict local elevation of  $[Ca2^{r}]_{i}$  (green) at endothelial junctions (blue) as neutrophils (red) transmigrate across a postcapillary venule in the mouse cremaster muscle in response to the inflammatory cytokine, IL-1 $\beta$ .



MATTHEW DEBERGE, PHD



EDWARD THORP, PHD

contributor to permanent heart damage after heart attack is due to excessive inflammation caused by reperfusion therapy (a treatment to restore blood flow) that patients receive at the hospital.

A recent study, published in the *Journal of Clinical Investigation* and led by Edward Thorp, PhD, associate professor of Pathology in the Division of Experimental Pathology, and Matthew DeBerge, PhD, research assistant professor of Pathology, found that an inflammatory cellular pathway previously thought to protect the heart after a heart attack actually causes damage. The team also found that inhibiting this pathway with small molecule inhibitors reduced myocardial infarction-induced damage in mouse models, demonstrating it as a potentially effective therapeutic strategy for patients after a heart attack.

"If patients could take this drug after acute myocardial infarction, we could potentially improve heart repair and therefore reduce their progression to heart failure," Thorp says. >



Another study, led by Sanjiv Shah, 'oo MD, the Neil J. Stone, MD, Professor of Cardiology, and published in *Circulation*, found that the presence of inflammatory proteins in the blood was associated with comorbidity burden and abnormal heart function in patients with heart failure with preserved ejection fraction (HFpEF).

SANJIV SHAH, MD

"Instead of the heart being the main area of injury, it is inflammation in the bloodstream that appears to be poisoning the heart and the blood vessels in HFpEF," Shah says.

The findings suggest these proteins could serve as therapeutic targets for patients with HFpEF and act as biomarkers for preventively identifying inflammation.

#### FACTOR IN NEUROLOGICAL DISEASES

Neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and multiple sclerosis (MS), all share a common factor — chronic inflammation.



Inflammation's role in Alzheimer's disease has been a focus of Robert Vassar, PhD, the Davee Professor of Alzheimer Research. He was co-author of a study published in *Nature* that identified a missing link between inflammation and protein deposits that contribute to the development of the disease.

ROBERT VASSAR, PHD

"These findings shed new light on the role of inflammation in Alzheimer's disease, providing a plausible pathway as well as a potential biomarker or therapeutic target for the condition," he says.

In the study, investigators conducted an unbiased screen to identify proteins that interact with the gamma-secretase complex, which generates the



This image shows an amyloid plaque (blue) surrounded by dystrophic axons (red) and reactive astrocytes (green). The reactive astrocytes respond to the amyloid plaque and participate in the inflammatory response in the Alzheimer's brain. Image courtesy of Robert Vassar, PhD.



Ultrastructure of myelinated axons in the central nervous system. Image courtesy of the Popko Laboratory.

Abeta protein that accumulates in the notorious amyloid plaques seen in Alzheimer's disease. That screening identified interferon-induced transmembrane protein 3 (IFITM3).

In mouse models of Alzheimer's disease and tissue samples from patients with late-stage Alzheimer's, the investigators found levels of IFITM3 was significantly increased. Deleting IFITM3, however, reduced the production of Abeta. Simulating inflammation also led to increased expression of IFITM3 and subsequently higher levels of Abeta.

"Our study suggests that anti-inflammatory drugs that cross the blood-brain barrier may lower IFITM3 levels and reduce Abeta production, which should delay the onset and progression of Alzheimer's disease," Vassar says.

Brian Popko, PhD, the William Frederick Windle Professor of Neurology, has investigated the cellular defense response to inflammation in MS, which affects almost three million people worldwide.

Published in the journal *eLife*, his most recent work with postdoctoral fellow Yanan Chen, MD, PhD, suggests that prolonging a cellular defense response to inflammation could help regenerate the protective coating of axons called myelin, which is degraded in diseases like MS.

YANAN CHEN, MD, PHD

"This small molecule could be a potential therapeutic because not only have we shown that it provides protection to oligodendrocytes against inflammation, but we now are showing that it promotes myelin repair in an inflammatory environment," says Popko, who is also scientific director of the Division of Multiple Sclerosis and Neuroimmunology in the Ken and Ruth Davee Department of Neurology.

BRIAN POPKO, PHD



Popko's team used genetic and pharmacological methods to prolong the integrated stress response in inflammatory models of MS, and discovered that the remyelinating oligodendrocytes, the cells that generate myelin, were protected from inflammation during the repair process. There are currently no FDA-approved drugs that effectively regenerate myelin. The findings, the authors argue, represent a breakthrough therapeutic strategy for treating MS.

#### A POTENTIAL TARGET FOR RHEUMATOID ARTHRITIS

A team of scientists led by Richard Pope, MD, the Solovy/Arthritis Research Society Professor and professor of Medicine in the Division of Rheumatology, and Deborah Winter, PhD, assistant professor of Medicine in the Division of Rheumatology, discovered that a type of immune cell called tissue-resident macrophage is necessary for the suppression of chronic inflammation.



**RICHARD POPE, MD** 

"This study shows tissue-resident macrophages being the guardian of preventing inflammation and provides a novel way of thinking about treating patients with targeted therapy," Pope says.

#### Rheumatoid Arthritis Meets Precision Medicine

reatment for rheumatoid arthritis has largely been trial and error, but Northwestern scientists are bringing precision medicine to the table. "I believe this could be game-changing," says Harris Perlman, PhD, chief of Rheumatology and the Mabel Greene Myers Professor of Medicine, who along with Pope and Winter, was senior co-author of a multi-site study that used genetic profiling of joint tissue to see which drugs will work for which patients, published in *Arthritis & Rheumatology*.

In this study, Perlman and colleagues segregated patients based on the genes being produced by their macrophages, the garbage collectors of the immune system that are overactive in rheumatoid arthritis. They identified two patient groups who



shared aspects of the genetic profiles and then which of them showed joint improvement, along with what biologic therapies they were taking. They also identified a gene sequence associated with patients with early disease. The next goal is to predict which patients will have the

HARRIS PERLMAN, PHD

best response — based on their genetic signature — to a specific drug.



In a previous study, published in *Nature Communications*, Pope and colleagues including first author Qi-Quan Huang, MD, research associate professor in the Division of Rheumatology, developed a mouse model deficient in the FLIP gene. This image from that study shows bone erosion (arrows) and inflammation (brackets) in the ankles of mice without the FLIP gene (bottom).

Previous work from Pope's laboratory found that a specialized protein called FLIP (FLICE-like inhibitory protein) protects macrophages from apoptosis, or cell death, and are also known to be highly expressed in macrophages of patients with rheumatoid arthritis. Using this knowledge, the investigators deleted FLIP from tissue-resident macrophages in mouse models of rheumatoid arthritis to ameliorate the disease. However, deleting FLIP actually promoted chronic inflammation in the mice by preventing monocytes — white blood cells produced in bone marrow — from differentiating into tissue-resident macrophages and perform anti-inflammatory functions.

The findings, which were published in *Science Advances*, disprove a long-standing notion that all macrophages are "bad" and only promote inflammation.

"If we want to treat people or prevent disease, we can't just get rid of all macrophages," Winter says. "We want to promote macrophages that are good for the joints and possibly reprogram the ones that aren't good."

As Muller points out, this area of study is a balancing act — and scientists across disciplines continue to get closer to answers through shared knowledge.

"It is exciting to perform these studies at a place like Northwestern, where the research culture is truly collaborative. It leads to great opportunities to combine expertise and explore new disease models," Muller says. ◆



DEBORAH WINTER, PHD

BY CHERYL SOOHOO PHOTOGRAPHY BY TERESA CRAWFORD

# Making Connections

D. James Surmeier, PhD, has steered the Department of Neuroscience to a new name and recognition of Northwestern Medicine's growing prominence in neuroscience research.

hat's in a name? Plenty, says D. James Surmeier, PhD, chair of the recently renamed Department of Neuroscience, formerly known as the Department of Physiology. The name was officially changed in September to better reflect Northwestern Medicine's exceptional strength in neuroscience. But long before the new departmental letterhead landed on his desk, Surmeier, who has been chair since 2001, had already begun the work of bringing the academic unit national and international attention.



"In the last 20 years, we have built a critical mass of talent in neuroscience, doubling our size by recruiting the best and brightest young neuroscientists. At Feinberg, we now have one of the largest neuroscience groups in the country. The research being done here is at the cutting edge in many areas of neuroscience, including movement control, neurodegenerative disorders, and neuropsychiatric disorders. It's also a great place for young neuroscientists to come and train — to find their bliss. The name change recognizes what we aspired to be and have become," says Surmeier, who is also the Nathan Smith Davis Professor of Neuroscience.

"As a department of physiology, we were consistently ranked in the top 5 to 10 programs in the country," he adds. "Although the pool of neuroscience departments is deeper, if the rankings were to be done today, we'd be in the top 10 in the nation."

#### **BUILDING BRIDGES ACROSS THE UNIVERSITY**

The designation of neuroscience more appropriately describes what the department has been doing for decades: piloting innovative studies in how the central nervous system works — and, more importantly, when it doesn't work and leads to neurological, psychiatric, and neurodevelopmental disorders.

Investigators focus on topics that span molecular, cellular, systems, and behavioral levels. Basic studies range from single-channel recording to behavioral analysis. Translational work in the department's research portfolio includes Parkinson's disease (PD), Alzheimer's disease, Huntington's disease, epilepsy, autism, schizophrenia, brain-machine interfaces, and chronic pain.

"But, of course, at Northwestern, the study of neuroscience is much broader than our department," says Surmeier.

The discipline draws upon expertise in myriad fields across the university's two campuses, ranging from chemistry, engineering, computer science, and biology to areas within the medical school, including neurology, neurosurgery, anesthesiology, psychiatry and behavioral sciences, and pharmacology.

"One of our aims will be to build bridges that foster scientific dialogue, cooperation, and collaboration," Surmeier says. "With the new name, we will build upon our achievements and serve as a beacon to the outside world that there is great neuroscience being conducted at Feinberg and Northwestern at large."

A flurry of requests has already come from faculty members seeking secondary appointments. "The collaborative environment here at Northwestern is second to none," Surmeier says.

#### STEADY GROWTH, COLLABORATIVE DISCOVERY

In the late 1970s, while pursuing a PhD degree in mathematics, Surmeier became fascinated with how the brain functions — in particular, the basal ganglia, the part of the brain that controls movement. The young scholar decided to shift gears and, in 1983, completed a doctoral program in physiology-psychology at the University of Washington. He has never looked back.

Joining Northwestern in 1998, Surmeier has had a prolific career in basal ganglia research, focusing on how it contributes to PD, Huntington's disease, and chronic pain. He has authored well over 200 peer-reviewed publications, many in high-impact journals such as *Science, Nature, Neuron*, and *Nature Neuroscience*.

In the early 2000s, he and his colleagues made an exciting discovery while exploring the causes of PD. They identified a protein, or more specifically, a calcium channel that triggered mitochondrial oxidant stress in



at-risk neurons. This novel finding published in *Nature* came as a result of collaborating with Paul Schumacker, PhD, professor of Pediatrics, Cell and Developmental Biology, and of Medicine, whose studies focus on the role of mitochondrial signaling in the development of pulmonary hypertension.

"It turned out that there were drugs approved to treat high blood pressure called dihydropyridines that inhibited this particular calcium channel," says Surmeier. "We thought this class of drugs might help slow the progression of early-stage Parkinson's disease."

Subsequently, epidemiological studies revealed that patients taking these hypertension medications had a lower risk of developing PD. Surmeier partnered with clinical colleague Tanya Simuni, MD, director of the Parkinson's Disease and Movement Disorders Center at Feinberg and the Arthur C. Nielsen Professor of Neurology. The Surmeier team's discovery led to a phase II and then a multi-center **>** 

#### Partners in Discovery

Surmeier's collaborations with other leaders in his discipline and beyond have yielded novel findings with translational implications.



PAUL SCHUMACKER, PhD, professor of Pediatrics, Cell and Developmental Biology, and of Medicine



TANYA SIMUNI, MD, director of the Parkinson's Disease and Movement Disorders Center at Feinberg and the Arthur C. Nielsen Professor of Neurology



**DIMITRI KRAINC, MD** chair and Aaron Montgomery Ward <u>Professor of N</u>eurology

phase III clinical trial evaluating the dihydropyridine isradipine. Ultimately, the phase III clinical trial, which was completed in 2018, failed to reach their clinical goals.

One of the possible reasons why the clinical trial failed was that the cardiovascular side-effects of isradipine significantly limited how much patients could take. Knowing this limitation, Surmeier teamed with Richard Silverman, PhD, professor in the Department of Chemistry, to develop a new, more selective inhibitor of the calcium channel implicated in PD. This long-standing collaboration has led to the identification of a novel drug class that has great promise. A collaborative effort between Surmeier, Silverman, and Alfred George, MD, chair of the Department of Pharmacology and the Alfred Newton Richards Professor of Pharmacology, has recently been endorsed by the Michael J. Fox Foundation with a multi-year award to identify compounds that have clinical potential.

"We are still confident that we have the right target and that by improving delivery of isradipine to the brain or by developing a more selective inhibitor, we can slow the progression of Parkinson's disease," says Surmeier. "But even if achieving adequate target engagement isn't feasible, this translational effort will teach us something important about the disease and bring us closer to a therapy that will succeed. It also has illustrated that Northwestern offers an environment that brings together people from different disciplines to effectively work toward a shared vision."

The Surmeier and Schumacker labs have continued to tease out how their target protein interacts with the mitochondria and leads to PD. Better understanding the connection may allow for potentially changing the dialog between the two and altering the course of disease development. In a recent study published in *Nature*, Surmeier and Schumacker demonstrated that loss of mitochondrial complex I function in dopaminergic neurons is sufficient in mice to produce a progressive, levodoparesponsive parkinsonism with features that closely resemble those of human PD. This work establishes a clear chain of events – from calcium channel mediated over-stimulation of mitochondria, to mitochondrial oxidant stress and damage to complex I, to PD pathogenesis.

As is often the case in science, there were unexpected findings, according to Surmeier. In this case, the progressive nature of the model allowed the investigators to dissect the role of regional dopamine depletion in driving PD symptoms. This work led to the surprising conclusion that the output of the basal ganglia (the substantia nigra) was a critical site of dopamine action in preventing movement deficits. Surmeier's team then demonstrated that a gene therapy could significantly boost the effects of levodopa in a model of late-stage PD — providing a potential alternative to deep brain stimulation.

#### NOVEL RESEARCH FINDINGS

Undeniably excited about asking research questions and finding the answers to them, Surmeier's curiosity has continued to yield novel research discoveries with translational implications.

One long-standing mystery has been why neurons that release dopamine are particularly vulnerable in PD. A collaborative study with Dimitri Krainc, MD, chair and Aaron Montgomery Ward Professor of Neurology, published in *Science* a few years ago, revealed that this vulnerability could be traced to an interaction between mitochondria and



#### Sharing Knowledge

The Department of Neuroscience draws upon expertise in myriad fields across the university's two campuses.

- Chemistry
- Engineering
- Computer science
- Biology
- Neurosurgery
- Anesthesiology
- Psychiatry & Behavioral Sciences
- Pharmacology

dopamine. But the precise nature of this interaction was unclear.

Teaming with Krainc and Schumacker, Surmeier and his associates discovered that mitochondria were metabolizing dopamine in axons - the most at-risk part of the neuron - to help them generate energy (adenosine triphosphate) for transmitter release. This boosting was mediated by monoamine oxidase (MAO) tethered to the outer membranes of the mitochondria. This process created oxidant stress on the mitochondria, particularly when dopamine synthesis was boosted by a precursor of dopamine - levodopa. This new finding has provided more insight into the role mitochondria, dopamine, and MAO play in PD and how that knowledge can inform current and future treatment. Patients with early-stage PD, for example, are often given MAO inhibitors to help boost dopamine levels in the brain. Published in Nature Neuroscience, this study suggests that this treatment strategy protects vulnerable dopaminergic neurons by limiting mitochondrial stress and damage.

Connecting seemingly disparate "dots" often leads to breakthroughs in science. A key feature of PD pathology is the formation of intracellular aggregates of a protein called alpha-synuclein. It has been thought that these aggregates spread through the brain, much like a prion. In a study published in Science Advances in 2020, Surmeier's team showed that strength or number of neuron-to-neuron connections was not a good predictor of how alpha-synuclein pathology spread. This finding raised the possibility that other neuronal traits, like mitochondrial oxidant stress, were important factors. The Northwestern investigators are actively pursuing the mitochondrial connection and exploring possible links between pathogenic mechanisms in PD. This work opens the door to the potential use and effectiveness of combination therapies to slow disease progression.

In another area of research, Surmeier has made inroads in developing the first viable treatment for Huntington's disease — a degenerative disease characterized by progressive motor and cognitive impairment and caused by alteration in the "huntingtin" gene. His team has published a series of papers in journals such as *Nature Medicine*, demonstrating that lowering mutant huntingtin with a zinc finger gene therapy effectively reverses neuronal pathology and behavioral deficits in animal models of Huntington's disease.

"We have an extraordinary opportunity to better understand the brain and to develop new treatments for brain disorders," he says. "New technologies are allowing us to link brain function at the molecular, cellular, and circuit levels to behavior in unprecedented ways. At the same time, we have a growing set of tools for correcting neuronal dysfunction that is making its way into the clinic. We truly have exciting times ahead of us." \*

# Leading the Way

The newly named Department of Neuroscience recently made another new name for itself on the world stage. This October, the Aligning Science Across Parkinson's (ASAP) initiative awarded not only one but two \$9 million grants to two different teams of Feinberg neuroscientists exploring the biological causes of Parkinson's disease to develop new therapies.

"To have two of 14 successful groups in this intense international competition come from Northwestern is an extraordinary accomplishment," says Surmeier, the coordinating lead principal investigator for one of the winning Feinberg projects. "This success is a testament to the fact that Northwestern has become an international leader in neuroscience research."

Surmeier's ASAP-funded project will explore the circuit dysfunction underlying motor and sleep deficits in a progressive mouse model of PD. Better understanding how this dysfunction begins could offer promise for earlier diagnosis, development of disease-modifying therapies, and enhanced treatment strategies for patients with later-stage PD. New faculty member Ann Kennedy, PhD, assistant professor of Neuroscience and other co-investigators at Columbia University, U.C. Berkeley, and the University of Basel (Switzerland) will be serving as co-investigators.

An ASAP award also went to Rajeshwar Awatramani, PhD, professor of Neurology in the Division of Movement Disorders, and his team for their project entitled "Redefining PD Pathophysiology Mechanisms in the Context of Heterogeneous Substantia Nigra Neuron Subtypes." This project involves neuroscience faculty from Feinberg, as well as neurobiology faculty on the Evanston campus.

Launched in 2017, the ASAP initiative is a private organization of funders working with the Michael J. Fox Foundation for Parkinson's Research to accelerate discovery by building a collaborative research network. PD is one of the most common movement disorders in the world, with some six million people living with the disease.

This most recent competition called for applications that focused primarily on circuitry and brainbody interactions — both areas of expertise at Northwestern. "These awards reflect the commitment of Northwestern to excellence in neuroscience research across both campuses," Surmeier says.

# **TRAINING ZONE**

WRITTEN BY MARTHA O'CONNELL PHOTOGRAPHY BY LAURA BROWN

# Motion Restored

Northwestern Medicine's Center for Spine Health gets patients back on their feet.



lutching the sides of buildings for stability as he walked to his office, Greg Duplaga, 65, was at his wit's end. Meticulous in his work as a permit engineer for the Chicago Fire Department, he was selling himself short when it came to his own health. "I could not walk because both my feet were numb,

and I was afraid I was going to collapse because I was not feeling them," he says.

Duplaga's primary care physician knew his patient's symptoms of numb feet and legs, along with neurogenic bladder, required urgent attention and steered him to Northwestern Medicine's Center for Spine Health. Imaging revealed severe spinal compression, making the last resort — surgery — the only solution. Had Duplaga not acted when he did, he could have had persistent issues for the rest of his life. While the thought of spine surgery can be scary, Duplaga fondly remembers a reassuring surgical team looking down at him in the operating room this past July.

"I knew that I could not live the way I did before my procedure," he says. "I am very lucky to be in the Chicago area with access to the best doctors."

Opened in June 2021, the Spine Center was created to quickly steer patients with back, neck, and spine pain — who might otherwise consult with five or six different types of specialists and come out with just as many treatment options from different institutions — to the correct treatment. Patients like Duplaga, who

> Alpesh Patel, MD, MBA, (left) and Tyler Koski, MD, co-directors of the Center for Spine Health

need surgery, receive it as soon as possible, but for 90 percent of patients surgery may not be the answer. It is this patient majority that the center is designed to serve. Instead of waiting to see a surgeon, patients are assessed by a multidisciplinary team to determine the best treatment.

"The right place for a patient to start is not at the end of the road with a surgeon, who sometimes can take two months to be available and may not even be the right person to treat the patient," says center co-director Alpesh Patel, 'oo MD, '20 MBA, professor of Orthopaedic Surgery and of Neurological Surgery. "We have dramatically flipped the care model."

#### ALLEVIATING FEAR

After four years of envisioning and planning, the Spine Center is now one of two such integrated academic medical center programs in the nation, combining all subspecialists in spine care. This eliminates the fragmented care patients may receive if they search for individual experts on their own, not to mention pain that is unnecessarily prolonged.

> "We are increasing the number of patients who get the right treatment and get it faster than they would if they started with a surgeon."

#### TYLER KOSKI, MD

associate professor of Neurological Surgery and of Orthopaedic Surgery

"When we were thinking out what the center should do, we got past our credentials, if you will, and down to the nuts and bolts of what we care about, and how we build trust to work with each other," Patel says. The Spine Center includes a cadre of interventional radiologists, physiatrists from the Shirley Ryan AbilityLab, nurses, neurosurgeons, orthopaedic surgeons, physical therapists, physician assistants, and support staff who all put their heads together to determine the best clinical approach for each patient and expedite therapy.

Mimicking prevalence in the larger population, complaints about lower back pain account for a majority of patients.

But for many, the mere thought of surgery is alarming. In fact, patients are asked on the intake questionnaire to rank how interested they are in spine surgery — many patients give this a "0." In the past, those patients would still wait to see a surgeon. Now they can get to a non-surgical specialist in a shorter time.

The Spine Center aims to take that fear away at the outset by reinforcing potential non-surgical options. Intake experts help start patients' paths by directing them to specialists according to symptoms described. Located on the 14th floor of Northwestern Memorial's Lavin Pavilion, the center encompasses just about every service patients might need. In addition to exam rooms, there are imaging areas and suites for corticosteroid injections. The physical therapy area is in the center, housing state-of-the-art equipment such as zero-gravity treadmills for low weight bearing exercise in water during the early stages of recovery.

"We are increasing the number of patients who get the right treatment and get it faster than they would if they started with a surgeon," says center co-director Tyler Koski, MD, associate professor of Neurological Surgery and of Orthopaedic Surgery. "This is much more efficient and timely care and gets people to the right medical provider at the right time. And if it turns out that a patient does need an operation, they have already done their due diligence with other consults and therapies. For patients like Mr. Duplaga, we were able to expedite his visit with me right away due to our algorithm."

Many patients who seek care at the Spine Center are experiencing muscle strain, spinal stenosis, bulging disks, shooting nerve pain, and other injuries or deformities that make walking agonizing or at least uncomfortable. To accommodate them, the center is organized in a loop configuration so patients only move forward through treatment areas before they exit, never backwards. The flow is logical and seamless, and reduces walking. Also, men's and women's changing rooms are connected to imaging rooms for privacy, and hallways are oriented for abundant natural light. This all adds up to an improved psychological experience that came about because patients were integrally involved in designing the center.

"I knew that I could not live the way I did before my procedure. I am very lucky to be in the Chicago area with access to the best doctors."



#### "We needed to coordinate to be able to zero in on the best care for each patient."

#### ALPESH PATEL, MD, MBA '20

professor of Orthopaedic Surgery and of Neurological Surgery

The Spine Center is also the first to pilot a patient tracking system that holds tremendous potential for other healthcare environments. A software program shows staff where each patient is at all times. When they check in, patients receive a badge with a QR code and Bluetooth sensor. Developed by a Northwestern Medicine physician, this tracking system relays the location of every patient, and an alert signals the team if a patient has been in one place for a long time. With hundreds of patients seen daily and many medical providers, the tracking system ensures that patients don't have lengthy waits or feel abandoned.

#### ANSWERING A WIDESPREAD PROBLEM

Nationally, lower back pain is the second most common reason people visit their physician. Healthcare systems like Northwestern Medicine

#### **TREATMENT FOR A RANGE OF CONDITIONS**

- · Spinal deformity
- $\cdot$  Spine oncology
- · Degenerative disk disease
- Failed neck or back surgery syndrome
- Peripheral nerve compression syndromes
- · Peripheral nerve injuries

- Rheumatologic disorders of the spine
- Spinal fractures and other traumatic injuries
- · Work-related injuries
- · Sports-related back and neck injuries





#### CROSS-DISCIPLINARY EXPERTISE

Physical Medicine and Rehabilitation Orthopaedic Surgery Neurological Surgery Neuroradiology Neuropsychology Musculoskeletal Radiology

Top: Imaging provides accurate information at all stages of care. Bottom: Patients were integrally involved in designing the center, which has a logical and seamless flow.

are being challenged by private and public insurers to prove that patients are actually getting better. The same thing that has happened with other high-volume types of care, such as for patients with diabetes or those who need hip replacements, is filtering down to the complexities of spine care, and value-based care is the new standard.

As the center was being planned, Patel, Koski and the rest of the Spine Center team believed they could not bring each patient the best possible outcomes without a unified clinical approach.

"Sometimes, too many cooks in the kitchen is not a good thing — you get too many conflicting ideas and too many appointments and treatments that don't give patients any



Duplaga and his family celebrating his son's graduation from the U.S. Marine Corps flight school in Florida.

meaningful relief. We knew that if we were going to make this work, we needed to coordinate to be able to zero in on the best care for each patient," Patel says. The fact that more than 90 percent of patients say they would return is evidence that the team is accomplishing its goal.

For Duplaga, who is walking unassisted and continuing to improve through rehabilitation, the Spine Center's individualized care has allowed him one of his most cherished memories – the ability to travel to Florida to pin wings on his son Dariusz upon his graduation from the U.S. Marine Corps flight school.

Speaking from the perspective of a patient and a parent, he says, "I think both my missions were accomplished." \*

# 

WRITTEN BY BRIDGET KUEHN

# Galter Health Sciences Library and Learning Center director Kristi Holmes, PhD, is helping bring biomedical libraries into the future.

s director of Northwestern's Galter Health Sciences Library and Learning Center, Kristi Holmes, PhD, is an influential leader in the field of informatics and data science. Under her leadership, the library's national and international reach continues to grow.

Galter is uniquely organized within the Northwestern University Clinical and Translational Sciences (NUCATS) Institute, where Holmes leads the Evaluation and Continuous Improvement Program. This powerful data-driven evaluation infrastructure is leveraged by over \$100 million in funded programs designed to enhance processes and impact by improving data quality for stra-

**IS A WORLD-**

**CLASS LIBRARY** 

AND TRUSTED

COMMUNITY.

tegic management and decision-making.

**GALTER LIBRARY** Holmes was recently appointed to the National Library of Medicine's (NLM) Board PARTNER TO THE of Regents. The appoint-**NORTHWESTERN** ment marks the first time a Northwestern faculty member has joined the

> prestigious NLM Board, which is charged with advising and guiding the NLM as it manages the global flow of medical information.

> The NLM is responsible for essential biomedical resources such as the PubMed database, National Center for Biotechnology Information (NCBI) data and tools, and the clinicaltrials.gov registry. The NLM also ensures that the public has access to reliable health information through resources such as MedlinePlus, which provides up-to-date easy-to-understand health and wellness information covering a wide range of topics.

"The NLM is charged with managing a terrific amount of data and standards," says Holmes, who is also professor of Preventive Medicine and of Medical Education. "These urgently important resources and the expertise of NLM's personnel impact the entire spectrum of research and health."

The NLM, through the NCBI, just announced plans to launch the NIH Comparative Genomics Resource (CGR), a four-year trans-NIH initiative to provide a comparative genomics cloud-based data and tool resource for eukaryotic research organisms. Holmes will chair the CGR working group to provide an open, transparent forum for extensive engagement of the scientific community to gather input from diverse perspectives and communities to help guide the development of this new resource.

#### FROM MICROSCOPES TO BIOINFORMATICS

Holmes grew up in Western Nebraska, fascinated by the natural world surrounding her.

"Looking back, my mom and dad did an amazing job of indulging my interest in science," she says. "I had a microscope and a telescope

from a very early age, a steady stream of books, and even today, we enjoy Milky Way stargazing and fossil hunting in the Sandhills where our cattle graze."

She went on to get a PhD in biochemistry and credits the data collection and curation work she carried out during graduate school with sparking her interest in information structure and datasets, and ultimately, biomedical informatics and data science. After completing graduate school, she joined Washington University in St. Louis as a bioinformaticist at Becker Medical Library to channel her interests in informatics into infrastructure development. She joined Northwestern in 2014.

"Every day is a new challenge and a new opportunity to learn and grow at Galter," she says. "The library truly provides an excellent vantage point on campus because it serves as an intersection of many different areas of excellence at Northwestern. Our talented and dedicated team is charged with a vast array of responsibilities, resources, systems, and >



The Galter Library, a hub of technology, research, and study, has recently undergone a \$7.5 million renovation.



Holmes with her husband and sons.

partnerships, many of which are behind the scenes."

In her role as director of Galter, Holmes has transitioned from hands-on data work to strategizing about research information systems, team science, technologies like artificial intelligence and machine learning, as well as partnerships across Northwestern and with community organizations.

"Never before have data and technology played such a central role in how we carry out our work. Even so, our library mission remains focused on supporting the research, patient care, education, and community engagement goals of Feinberg," she says.

#### **GROWING MENU OF SERVICES**

Galter Library is a world-class library and trusted partner to the Northwestern community. The library facility serves as a bustling center for learning, sharing, and collaboration. Exhibits and programming catalyze in-depth discussions on a wide range of topics and share the history of the Feinberg School of Medicine. Behind the scenes, Galter provides rapid access to a wide range of information resources, thanks to a talented team working on different facets of library services and systems.

Galter has expanded considerably under Holmes's leadership. The library offers a liaison librarian program to provide every department, center, and institute at Feinberg a dependable partner to quickly connect them with research information support. Galter also offers popular systematic review services, a clinical informationist program, world-class research assessment and communications services, and an extensive list of classes across a wide range of topics. The library also collaborates on several NIH-funded community partnerships that provide access to authoritative health information, empower research participation, and support efforts to advance knowledge and health equity.

The library's DataLab offers a high-tech data core for training, one-on-one consultations, and building a community of practice around translational informatics, data management and analysis, and digital systems. Over the past year, the DataLab has partnered with Northwestern Medicine's Enterprise Data Warehouse (NMEDW) on a new clinical data retrieval and management program that continues to evolve in response to campus needs.

Another sign of Galter's growing reach as a national and international leader in data science is its partnership on an international effort with the European Council for Nuclear Research (CERN), one of Europe's most well-respected research centers, to develop InvenioRDM, an open-access research data management repository and data catalogue to promote best practices in data management, sharing, and reuse. InvenioRDM supports FAIR (Findable, Accessible, Interoperable, and Reusable) principles, making it a valuable tool to support open science, comply with research sharing requirements such as the upcoming NIH Policy for Data Management and Sharing, and enable discovery of Northwestern research. The long-term support version of the software was just released in August, with several universities already committing to adopt the tool.

"InvenioRDM brings together best practice data standards and technology in a smooth package," Holmes explains. "I am incredibly proud of our team's contributions and their role in this important international project. This has been a massive undertaking and we look forward to implementing it for Northwestern."

Galter is also a critical hub for the Feinberg community and was one of the only health science libraries to remain open throughout the pandemic. Holmes credits the library's Access Services team for making this possible, successfully creating a welcoming, productive, and healthy physical space for in-person study, research, and collaboration.

"We're fortunate to have such a talented team across Galter," Holmes says. "The work we do fully reflects our campus — a place where there's such enthusiasm, creativity, and dedication. It's really what makes it possible for us to push boundaries and all play our part in advancing Northwestern's mission." ❖

## **EVALUATION EXCELLENCE**

Earlier this year, the library was named the National Evaluation Center for the Network of the National Library of Medicine (NNLM), a group of seven regional libraries and 8,000 member organizations across the U.S. that disseminate health information through public libraries, schools, community-based organizations, and patient advocacy groups. The affiliation with Galter came with a five-year, \$4 million award to help boost inclusive access to health information and use of cutting-edge, data-driven technology. "The new National Evaluation Center is a great way for Northwestern to shine, and I am honored to be joined by such an accomplished team of collaborators," says Holmes. "We're excited for this opportunity to share our work on the national stage in support of such an important mission."

The center will be led by a talented, multidisciplinary team of faculty and builds on data and evaluation resources across Feinberg, including Galter, NUCATS, the Evaluation, Data Integration, and Technical Assistance program, and beyond.

#### ALUMNI

Alumni President's Message



# Let's All Be Quinquagenarians!

A letter from Edward S. Kim, '92 BS, '96 MD (HPME)

he number 50 has come to symbolize many important events. Birthdays are the first to come to mind. As we age, different milestones carry significance. When kids reach double digits, teenage years, and certainly 16, 18 and 21, they begin to have more freedoms. Not long afterward, real adulthood looms large. Many fear 30 and 40. I still remember as a first-year at Feinberg, our biochemistry professor said that biochemically speaking, everything is downhill after age 33, as the body goes from a healing mode to an aging mode. (That's what I remember from biochemistry.) Ugh.

Fifty brings its own mix of feelings. I had the privilege of turning 50 during the pandemic. This milestone made me reflect on many things, including that I'm more than halfway through life. On the more positive sides, it made me excited to look down the road, to assess my family, their future, and the cherished memories we will create. My wife Florence celebrated her 50th birthday recently, and I had the privilege of spending it with her. The positive outlook of 50 is so symbolic and important.

In case you are wondering, we're called quinquagenarians.

If mathematics is more your thing, then 50 is the smallest number that is the sum of two non-zero square numbers in two distinct ways: 50 = 12+ 72 = 52 + 52. (I had to look at this a couple times to understand it.

In religion, we have several meanings for 50.

- In Kabbalah, there are 50 Gates of Wisdom (or Understanding) and 50 Gates of Impurity.
- The Christian Feast of Pentecost takes place on the 50th day of the Easter Season.
- The Jewish Pentecost takes place 50 days after the Passover feast (the holiday of Shavuoth).

According to Biblical Numerology, the number 50 is a symbol of freedom, release, and new cycle. Every 50 years in the day of Atonement people needed to honor the Jubilee, a day when all the loans and debts were forgotten and forgiven to the one who took a debt, and all the slaves were released, and all the things taken were turned back to people they belonged to. It was a day when harmony was established.

Since we are all in science, we should also include the fact that 50 is the atomic number of tin, the fifth magic number in nuclear physics, and the percent of genetic overlap of a parent and offspring.

If we want to explore what the characteristics or horoscope for 50 is, there are some fun facts according to Affinity Numerology. The numerology number 50 expresses its sense of personal freedom — the pursuit of whatever may be of interest without resistance from its inner self or from others. The number 50 likes to talk and play and imagine and have fun, especially when it involves experiencing something it hasn't experienced before. The number 50 is witty. People generally smile a lot when they're around 50. The essence

of the number 50 almost always focuses on the positive side of things rather than the negative. I believe it is these characteristics of 50 that we should embrace and move forward with.

This coming spring, during Alumni Weekend (April 29–30), we have three classes celebrating their 50th reunions: 1970, 1971, and 1972. Two were postponed, but milestones are important to celebrate — even belatedly! At Feinberg, we also have the Half Century Club, which celebrates alumni who graduated 50+ years ago. Personally, I will be celebrating my belated 25th reunion this year (halfway to 50).

As we transition into another fall and winter season and celebrate various milestones, let's all be 50 — whatever your age, it's a good state of mind.

Kim and his wife Florence celebrating her 50th birthday.

#### ALUMNI **Profile**

Sandra Carson, MD, has devoted her career to finding innovative solutions to reproductive challenges.

# Fertility Pioneer

hen Sandra Carson, '75, '77 MD, '81 GME, created the first artificial ovary in 2010 she was trying to fill an urgent need in the field of reproductive endocrinology.

At the time, only immature eggs could be frozen, but there was no way to allow them to mature outside of a woman's ovary. This was a major barrier to helping preserve the fertility of women with cancer or other conditions. The solution Carson developed was an early generation 3-dimensional organoid of the ovary. She and her colleagues grew layers of donated ovarian cells in a mold into a mini ovary that was able to mimic the environment that allows the egg to mature. The achievement was named one of the top 10 medical breakthroughs of the year by Time magazine. Now that it is possible to freeze mature eggs, the device has found a new use testing the effects of reproductive toxins and chemotherapeutic drugs on developing eggs in the laboratory.

The artificial ovary is one of many solutions developed by Carson, who holds 14 patents and has published more than 160 journal articles during her career. She has developed tools that obstetrician-gynecologists use during procedures to diagnose uterine disorders and she also developed a nonsurgical way of diagnosing and treating ectopic pregnancies.

"It's not that I wanted to develop a device to develop a device," Carson says. "It's because there was a problem that came up that we needed a solution for."

#### A Career is Born

When Carson began her medical education journey at Northwestern, she had her sights set on becoming an anesthesiologist. She wanted to get an MD and PhD in chemistry and do pharmacokinetic research. Delivering a baby in October 1977 as a medical student under the supervision of a resident permanently shifted her career path toward obstetrics. But she quickly found herself drawn to reproductive endocrinology, the only field that could keep her up reading after being up all night at the hospital.

"I never had another 5-year plan after that," Carson says.

After completing her residency in obstetrics and gynecology at Northwestern in 1981, she completed a fellowship in reproductive endocrinology at Michael Reese Hospital and the University of Chicago Medical Center. It was a heady time in the field of reproductive endocrinology. The first baby successfully delivered after in vitro fertilization (IVF), Louise Brown was born in England in 1978 and three years later the first (IVF) conceived baby was born in the United States.

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"Over the last 40 years, I grew up with the field," Carson says.

That experience really shaped her approach to research. Over the years, she recalls, some things initially believed to be inconsequential proved to be essential, and procedures once considered taboo become common place. For example, she says that It taught me to always question the axioms and not to be afraid to design studies that some people say can't be done."

initially she and her colleagues believed injecting anything into the egg would kill it, but now sperm is routinely injected into eggs.

"It taught me to always question the axioms and not to be afraid to design studies that some people say can't be done," Carson says.

That perspective empowered Carson to present research at the 44th Annual Meeting of the American Fertility Society in 1988 on a nonsurgical algorithm for diagnosing and treating ectopic pregnancy, despite initial resistance to the idea. She also participated in the initial clinical trials of methotrexate to treat ectopic pregnancy. It took almost two years to get the trial results, because there was hesitance in the field to switching to treating the life-threatening condition with a drug, she said. But now methotrexate is routinely used to treat ectopic pregnancies.

Carson continues to be an innovator in the field. She recently developed a new device with her colleague John Buster, MD,

CAREER MILESTONES

a reproductive endocrinologist at the Women & Infant Fertility Center in Providence, Rhode Island. "It's a catheter that can flush embryos out of the uterus for genetic testing. This allows women who are interested in genetic testing for their embryos to avoid the need for in vitro fertilization," she explains.

"This is an easy process where the patient can have sex at home and then have her uterus lavaged and have the embryo retrieved," she says.

This development work has been shaped by Carson's experience working with patients, as attending physician and an assistant professor of obstetrics and gynecology at University of Chicago Pritzker School of Medicine and associate professor of obstetrics and gynecology at University of Tennessee College of Medicine. She later served in leadership roles in assisted reproduction and reproductive endocrinology and as professor of obstetrics and gynecology at the University of Tennessee College of Medicine in Memphis, Baylor College of Medicine in Houston and at the Warren Alpert Medical School at Brown University in Rhode Island. Throughout most of her career, Carson not only cared for patients as their reproductive endocrinologist, but she also delivered many of her patients' babies.

"There is no honor greater than a patient inviting you to deliver her baby," she says. "I love obstetrics."

#### **Giving Back**

Though Carson no longer practices obstetrics she continues to care for patients in her current role as director of the Division of Reproductive Endocrinology and Infertility at Yale University Medical School in New Haven, Connecticut where she is professor of Obstetrics, Gynecology and Reproductive Sciences and Director of the section of Reproductive Endocrinology and Infertility.

"I had a wonderful career in obstetrics and gynecology, and I loved it," she says. "I loved the teaching, the patients, and the education."

She continues to relish the opportunity to mentor medical students, residents, fellows, and other faculty as they grow their own careers in her current role. She is inspired by the many wonderful mentors she had at Northwestern who emphasized the importance of being a part of the community of medicine by participating in medical organizations like the Chicago Gynecological Society, the American College of Obstetrics and Gynecology (ACOG), and the American Board of Obstetrics and Gynecology.

She took that lesson to heart and served as the vice president of education at ACOG for six years. In that role, she helped put the annual examination for obstetrics and gynecology residents online, making it available for residents in 11 countries. She also helped boost attendance at ACOG's annual meeting by shortening it and increasing the number of interactive sessions. Additionally, Carson has served as president of the American Society of Reproductive Medicine from 2002 to 2003 and as chair of the U.S. Food and Drug Administration's Advisory Committee on Reproductive Drugs as well as editor-inchief of the journal Sexuality, Reproduction and Menopause and The New England Journal of Medicine's publication NEJM Journal Watch Women's Health.

"I wanted to give back to the field while I was young enough to do it," she says, adding "It's important to connect with people you are working with, remember those who have trained you, and pass your knowledge forward." \*

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1977	1983	1983-	1986-	1994-	2002-	2003-	2007-	2007-	2013-	2019-
Graduated	Finished	1986	1994	2007	2003	2007	2013	2011	2019	present
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Program	at Michael	Obstetrics and	College of	Reproductive	Society of	College of	and Infertility	Sexuality,	College of	Endocrinology
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Education at	Hospital and	the University	Memphis and	at the Baylor	Medicine	and	Alpert Medical	and	and	at Yale
Northwestern	the University	of Chicago's	served as chief	College of		Gynecologists	School of Brown	Menopause	Gynecologists	University
	of Chicago	Pritzker School	of In Vitro	Medicine in		, -	University in		as vice	Medical
	Medical	of Medicine	Fertilization	Houston			Providence,		president of	School
	School						Rhode Island		education	

## **PROGRESS NOTES**

We'd love to hear from you! Please share your recent news, accomplishments, and important milestones with us.

Send your updates and high-resolution photos to **medcommunications@northwestern.edu**. We will publish them in an upcoming issue of the magazine.

#### **1970**s

Bruce Scharschmidt, '70 MD, former Medical Alumni Association Board president and current member, recently published his first children's book, "Maggie's Magic Map: An Adventure with Olive the Octopus and Her Thousand Hatchlings." Scharschmidt is an independent director and consultant to biotechnology companies. He previously served as professor of Medicine and chief of Gastroenterology at the University of California, San Francisco, editor of the Journal of Clinical Investigation, and president of the American Society for Clinical Investigation. He later turned to a career in industry, beginning with Chiron - one of the original Bay Area companies that spawned the biotechnology revolution - and served as senior vice president and chief medical and development officer at Hyperion Therapeutics. Scharschmidt is a recipient of Feinberg's Distinguished Medical Alumni Award and the Northwestern Alumni Association's Service to Northwestern Award. 🔯 1

*David Skorton, '74 MD*, gave testimony on the topic "A Dire Shortage and Getting Worse: Solving the Crisis in the Healthcare Workforce" before the Subcommittee on Primary Health and Retirement Security of the U.S. Senate Committee on Health, Education, Labor and Pensions. The testimony focused on the looming physician shortage, including the importance of both primary care and specialty workforce needs, rural settings, and the continuing critical need to diversify the physician workforce. Skorton is president and CEO of the Association of American Medical Colleges. 2

*Charlotte Yeh*, '75 *MD*, is among the "2021 Most Influential Clinical Executives" recognized by *Modern Healthcare*. Yeh is chief medical officer for AARP Services, Inc.

*Mark Hill, '77 MD*, is part of a rock and roll band formed in 1987 called Dr. Mark and the Sutures. Drawing inspiration from the Beatles and the Eagles, the band, made up of physicians and businessmen on Chicago's North Shore, was founded on a lark to provide entertainment for a neighborhood block party. Hill's son, Adam Hill, PhD, now a professor of Engineering at University of Derby, England, is also a part of the band, and has been playing and touring since he was a boy through college.

Dr. Mark and the Sutures, one of the first "doctor" rock bands in the country, and the first in the Chicagoland area, garnered attention by the general public and media. The band has performed for medical charities, benefits, service organizations, and community events, and has been featured on ABC, NBC, and FOX, and radio stations, including WCKG and WUSN.

#### **A Special Connection**

While recovering from hip replacement surgery, Pamela L. Simon (née
Dennis), '75 PT, was assigned a home health physical therapist to aid in her recovery — Marian J. Diaz (née Barrett), '79 PT. Having never met before, this chance encounter brought these two
Florida-based residents together, later to discover a surprising connection: both were alumni of the Northwestern
Physical Therapy and Human Movement Sciences program.

Simon and Diaz shared that they spent their sessions "recollecting about their time at Northwestern, dishing about and fondly remembering their old professors, and talking about [their] careers that were set in place by the program." Afterward, they even shared photos from their days at Northwestern. Pamela has since recovered from her surgery, but their friendship has only just begun.



Marian J. Diaz (née Barrett), '79 PT (pictured left) with Pamela L. Simon (née Dennis), '75 PT (pictured right), during Pamela's last physical therapy session with Marian after hip replacement surgery.

They have performed at Allstate Arena, Taste of Chicago, Ravinia Festival, and Lambs Farm, to name a few, and have opened for national celebrities such as Tim McGraw, Randy Travis, and Martina McBride.

After taking an 18-month hiatus (due to the pandemic), Dr. Mark and the Sutures performed once again for their "Get Back" show on August 14 at Port Clinton Square in Highland Park, Illinois. 10 3

#### Steven Immerman, '77 MD, '81 GME, FACS,

published a large case study for the treatment of pilonidal disease using the Bascom Cleft Lift Procedure. Immerman sees patients from all across North America, and even as far as China and Korea. A general surgeon with a success rate of 98 percent, he has given talks at the International Pilonidal Society meetings in Berlin and Vienna and had surgeons come to Eau Claire, Wisconsin (where he practices) to observe his technique. Immerman is one of the national experts in the treatment of pilonidal surgery and would be especially happy to share his expertise with other Northwestern general surgery graduates. He can be contacted via his website at pilonidal.net. 20 4

#### CHARLOTTE YEH, '75 MD, IS AMONG THE "2021 MOST INFLUENTIAL CLINICAL EXECUTIVES" RECOGNIZED BY MODERN HEALTHCARE.

#### **1990s**

*Laura Offutt, '94 MD*, completed her residency in internal medicine at Thomas Jefferson University after graduating from Feinberg. She worked in academia, clinical research, drug development, and medical consulting. Over the last decade, Offutt has shifted her focus into being a passionate advocate for teens and their health, and is the founder of the annual International Adolescent Health Week (IAHW).

IAHW, which takes place in March, is a health campaign consisting of dynamic participatory events to inspire adolescents and their communities to advocate for a successful transition into adulthood. Envisioned and celebrated initially as Pennsylvania Teen Health Week in 2016, this initiative grew into a Global Teen Health Week by 2018 and evolved into International Adolescent Health Week in 2020. Unfortunately, due to COVID-19, IAHW 2020 activities were either canceled or significantly scaled back.

In March of 2021, however, Offutt worked closely with Youth Ambassadors from six continents, and in collaboration with the International Association of Adolescent Health and the Society of Adolescent Health and Medicine, to celebrate IAHW across the world through a combination of in-person and virtual events. In honor of IAHW, buildings and structures were illuminated lime green, the official color of IAHW. With the theme of "Adolescent Resilience in the Face of a Pandemic," events were held in more than 30 countries across six continents. They included an educational webinar hosted by the United Nations Educational, Scientific, and Cultural Organization chair on Global Health and Education, a special press briefing by the Nigerian Minister of Health, a podcast focused on adolescent resilience hosted by the American Medical Association, and a digital gallery with submissions from international youth sharing how they experience living in a pandemic. 05



#### **ALUMNI Progress Notes**



*Raymond Sanchez, '94 MD*, chief medical officer at Cerevel Therapeutics, is a recipient of the prestigious "Top 100 Leaders in Healthcare" award by the International Forum on Advancements in Healthcare (IFAH). Sanchez's extensive contributions to the field of medicine and psychiatry were paramount in securing this nomination. He accepted his award virtually at the IFAH USA Conference held June 23–25. 10 6

#### 2000s

Kathleen M. O'Leary, '04 MD, has joined Midwest Fertility Specialists in Carmel, Indiana. Previously, O'Leary practiced reproductive medicine in Cincinnati, Ohio, and served as lieutenant colonel in the United States Air Force. She was chair of the Reproductive Endocrinology and Infertility (REI) Division of the 88th Surgical Operations Squadron at Wright-Patterson AFB in Dayton, Ohio, and also served as medical director of the Women's Health Clinic and REI consultant to the Air Force Surgeon General. O'Leary is board certified in both obstetrics and gynecology and in reproductive endocrinology. 1 *Cory Simpson, '10 PhD, '12 MD, FAAD*, a graduate of the Feinberg Medical Scientist Training Program, recently accepted an assistant professor position at the University of Washington after completing his dermatology residency and research fellowship at the University of Pennsylvania. He will move to Seattle this fall to join the Division of Dermatology on the physician-scientist track. He plans to build a research program using advanced microscopy to understand epidermal development and disease with the goal of developing novel treatments for patients with rare dermatological disorders.

*Brian J. Miller, '11 MD*, testified in front of the United States Senate Committee on the Judiciary's Subcommittee on Competition Policy, Antitrust, and Consumer Rights as an expert on hospital consolidation at the hearing entitled, "Antitrust Applied: Hospital Consolidation Concerns and Solutions" on May 19. **© 8** 

*Eseohi Ehimiaghe, '20 MD*, a first-year resident at McGaw, was recently featured in the *Chicago Tribune* as part of an article celebrating that, for the first time in Northwestern Medicine Prentice Women's Hospital's history, a team of OB-GYN medical residents is all Black and all female.

**ESEOHI EHIMIAGHE**, '20 MD. A FIRST-YEAR **RESIDENT AT MCGAW.** WAS RECENTLY **FEATURED IN THE** CHICAGO TRIBUNE AS **PART OF AN ARTICLE CELEBRATING THAT.** FOR THE FIRST TIME **IN NORTHWESTERN MEDICINE PRENTICE** WOMEN'S HOSPITAL'S **HISTORY, ALL OF THE MEMBERS OF A TEAM OF OB-GYN MEDICAL RESIDENTS ARE BLACK AND FEMALE.** 

#### GME

Joel Koransky, MD, '81 GME, retired in 2013 after 20 years in private practice in Saratoga Springs, New York, and then Northern California, where he joined the Department of Dermatology at Kaiser Santa Clara, serving as chief for three years. Koransky now enjoys piano, voice, duplicate bridge, biking, and traveling. He writes, "My life is enriched by my companion Barbara Dutra, my son Jay, my daughter Leah, my son-in-law Justin, and my twin sister Ada who is also a Northwestern graduate." Koransky also expresses gratitude, as he reflects back at his time at Northwestern: "I wish to acknowledge Nancy Esterly, MD (1935–2017), for her tutelage during and after my dermatology residency."

*Melissa L. Gilliam, MD, '99 GME*, was named executive vice president and provost of The Ohio State University (OSU), and the first woman of color to serve in this role. Prior to joining OSU, she served as vice provost, the Ellen H. Block Distinguished Service Professor of Health Justice, and professor of Obstetrics and Gynecology and Pediatrics at the University of Chicago. (2) 9

Melina R. Kibbe, MD, '03 GME, was named dean of the University of Virginia's (UVA) School of Medicine and chief health affairs officer for UVA Health. An alumna of Feinberg's Vascular Surgery fellowship program, Kibbe will serve as the 17th dean of the medical school. Previously, Kibbe served as the Colin G. Thomas Jr. Distinguished Professor and chair of the Department of Surgery at the University of North Carolina at Chapel Hill (UNC), where she also held an appointment in the Department of Biomedical Engineering. In 2016, Kibbe became the first woman to serve as chair of UNC's Department of Surgery. In addition, she also is editor-in-chief of the Journal of the American Medical Association Surgery. 10

James J. Conners, MD, '08, '09 GME, was

appointed chair of the Department of Neurological Sciences at Rush University Medical Center after serving in an interim capacity. Conners has served as medical director of the Comprehensive Stroke Center since 2011, as chief of the Section of Cerebrovascular Diseases since 2012, and led the clinical operations of the Department of Neurological Sciences since 2019. He also is associate professor of Neurological Sciences at Rush Medical College and the recipient of the 2020–2021 Rush Faculty Excellence Award for Excellence in Clinical Service. © 11 *Constants Adams, MD, '21 GME*, was featured in an ABC 7 Chicago segment on what inspired her to become a physician. Her mother, for whom Adams is named, ran a home for women battling HIV and drug addiction in Detroit, Michigan, in the early 1990s. As she shares in the interview, it was her mother's work and dedication that motivated Adams to pursue a career in medicine and care for those in need.

#### PhD

*Inger Burnett-Zeigler, '10 PhD*, recently authored a new book, "Nobody Knows the Trouble I've Seen: The Emotional Lives of Black Women," in which she offers Black women a new framework in which to understand how their life experiences have impacted them and offers strategies to adopt practices for body and mind health. Burnett-Zeigler, associate professor of Psychiatry and Behavioral Sciences at Feinberg, discussed her new book in an interview with *Northwestern Now*.

Sarah Bassett, '19 PhD, a graduate of Feinberg's Health Sciences Integrated PhD Program, is now the research director for the U.S. House of Representatives Committee on Financial Services. © 12

#### DDS

*Robert M. Pick, '80 DDS, '82 CERT, MS, '84 MS, FACD, FICD*, started a Facebook group earlier this year called "Purple-Cow-Wow!" focused on the prioritization of ethics and excellence, and how to stand out in a remarkable way. Pick shared that "in today's world, you must be able to separate yourself from the competition. So important! But what do you do differently that separates you from the rest!?" Group members include dentists, physicians, and the general population — from mayors to CEOs. All are welcome to join the group for weekly interviews, motivational posts, and more.

Progress Notes continues on page 39 »

#### **Inclusion and Allyship: Sharing Stories**

"I am a Northwestern Legacy. I have worn the purple for undergraduate, medical school, residency, and lastly as an attending for 34 years. I entered an institution that did not see the systemic racism and bias it harbored but I have stayed because that same institution was willing to work on changing that culture.

The first "minority affairs" office at NUMS (Northwestern University Medical School) was unofficial and located in the small backroom of the research lab of the only basic science African American faculty member at the medical school, Dr. Dennis Perry. It was a safe space for the few minority medical students and residents to find



Tacoma McKnight, '81 BS, '83 MD (HPME), '87 GME

allyship. He was a diversity trailblazer at NUMS at a time when the culture of the place reflected the discrimination and bias of society overall against African Americans in particular. Delores Brown was appointed as the Minority Affairs Dean along with her real job as Dean of Admissions once Dr. Perry retired. This two-job plan for one person was not designed for successful equity work; however, I worked beside both of them on committees, panels, and task forces throughout my medical school, residency, and early attending years, finally becoming the first Minority Affairs Dean with a sliver of protected time and a program assistant supported by the medical school. The first official Office of Minority Affairs was on the first floor of the Ward Building and only large enough for one desk for the program assistant. That progress from the back closet of a microbiology lab to the first floor of a major medical school building took 15 years of work by likeminded diversity workers from the ranks of medical students, residents, faculty, and administrators. That shared accomplishment was real change."

- Tacoma McKnight, '81 BS, '83 MD (HPME), '87 GME, associate professor of Obstetrics and Gynecology

We would love to hear your stories of Inclusion and Allyship. Please submit your story by emailing **gina.bazer@northwestern.edu**.

#### ALUMNI

#### **In Memoriam**

Northwestern Medicine expresses its condolences to the families and friends of the following alumni (listed in order of their graduation year) and faculty who have passed away. All dates are in 2021.

#### ALUMNI

Robert W. "Bill" Porter, '47 BSM, '48 MA/MS, '51 MD, '52 PhD Marin County, California JUNE 9

Norman R. Eade, '50 BSM, '51 MD Carmichael, California JULY 15

Mary Ann Loewer, '51 BSDH Elmhurst, Illinois JUNE 15

**Thomas E. Nix, Jr., '52 MD** Oklahoma City, Oklahoma JULY 1

Kenneth F. Schmitt, '53 DDS Madison, Wisconsin MAY 15

William H. Luginbuhl, '53 MD Kennett Square, Pennsylvania JUNE 21

Frances Heusinkveld, '54 BSN Dallas, Texas JUNE 5

**Franklin C. Dallimore, Jr., '54 DDS** Ogden, Utah JULY 23

Joseph P. Derrick, Sr., '54 MD Beaumont, Texas APRIL 7

Robert C. Eberle, '54 MD Virginia MAY 30 William R. Herrera, '54 DDS Santa Fe, New Mexico JULY 6

Charles G. Reitinger, '55 DDS Gunnison, Colorado JULY 6

Dolores A. Spickerman, '55 BSN Morris, Illinois JULY 30

Edward A. Straka, Jr., '55 DDS Salem, Oregon APRIL 26

Walter L. Gabler, '56 DDS, '64 PhD Portland, Oregon JULY 7

Mahlon Burbank, '57 MD Rochester, Massachusetts JULY 23

Patricia L. Rasmussen, '58 BSDH Janesville, Wisconsin JUNE 28

**Donald R. Barnes, '59 MD** Bigfork, Montana JULY 1

Ferdinand L. lacoletti, '59 DDS Albuquerque, New Mexico MAY 26

John A.G. Harrigfeld, '59 DDS, '65 MSD Modesto, California JULY 21

Earl F. Bracker, '60 MD Charlottesville, Virginia JUNE 22

Thomas R. Eckman, '61 MD Chapel Hill, North Carolina AUGUST 9



#### David "Dave" L. Koehler, '57 MD Portland, Oregon JULY 5, 2021

Dave Koehler, MD, passed away peacefully at home with his family by his side. He was raised in Polson, Montana and attended Montana State University, followed by Northwestern for medical school. Koehler served his country as a navy doctor. He then practiced medicine in California and

spent 25 years on the staff of Kaiser Permanente in Portland, Oregon. Sailing, particularly wooden boats, was a passion. In his retirement, he enjoyed building furniture and boats while managing Koehler's 7L Polled Hereford farm. Koehler supported the Clackamas County Junior Livestock Auction for 42 years. He is survived by his wife of 58 years, Mary Lou, daughters Lou Anna Koehler and Celia Koehler, son-in-law Paul Blanchard, and sister Karol Newgard.



William R. MacMaster, Sr., '64 MD Eugene, Oregon MAY 27, 2021

William Rutan MacMaster Sr., MD, was born in New York City and raised in Evanston, Illinois. In 1960, he graduated from Princeton University where he was a history major, and then went to medical school at Northwestern. While a medical student he married Nancy Seinwerth, a student nurse at

Chicago Wesley Memorial Hospital, and they started a family. He specialized in psychiatry and had private practices in Northern California before retiring in 2000 and moving to Eugene, Oregon, in 2013. He loved being outside and was active in the Sierra Club. He also loved travel and explored destinations including Africa, Cambodia, China, and Antarctica. He is survived by daughters Sally (Slagel) of Eugene, Gwendolyn (Beer) of Albuquerque and her husband Joel, and his son Bill MacMaster Jr., '96 MD, of Eugene and his wife Lisa, along with eight grandchildren.

#### FACULTY



Lewis Landsberg, MD, former dean of the Feinberg School of Medicine and chair of the Department of Medicine SEPTEMBER 23, 2021

Lewis Landsberg, MD, transformed the medical school during his 30-year career. He joined the faculty in 1990 as the Irving S. Cutter

Professor and chairman of the Department of Medicine and as physician-in-chief at Northwestern Memorial Hospital. Nine years later, he was appointed vice president for medical affairs and dean of the medical school.

Landsberg was a towering figure in the fields of metabolism regulation, the sympathetic nervous system, hypertension, and obesity. He was also the author of more than 230 peer-reviewed publications and two books, which summarized his personal clinical experience in internal medicine, as well as his laboratory research.

"Lewis Landsberg was an inspiring leader, a peerless bedside teacher, and an exceptional scientist. As a dean, his tenure was an energizing force and his influence can now be

felt in every part of the medical school. Even today, we continue to build on the foundation that he started. He will be sorely missed as a friend of many, but he leaves behind an enduring legacy," says Eric G. Neilson, MD, vice president for medical affairs and Lewis Landsberg Dean.

# *"Example is critical. The most important lessons in medical education are taught by example."*

**Lewis Landsberg, MD**, quoted in the Fall 1992 edition of *Northwestern Medicine* magazine

Landsberg received his bachelor's degree from Williams College in 1960 and his medical degree from Yale University School of Medicine in 1964. He pursued residency training in internal medicine at Yale-New Haven Hospital, and a research fellowship at the National Institutes of Health, working in the laboratory of Nobel laureate Julius Axelrod, MD. He was recruited to Northwestern from Harvard Medical School, where he had served as professor of Medicine and chief of the Division of Endocrinology at the Beth Israel Hospital.

After stepping down as dean, the medical staff of Northwestern Memorial Hospital and the Northwestern Medical Faculty Foundation made an extraordinary endowment gift to create and name the Lewis Landsberg Deanship. The

Right: Landsberg standing in front of the bridge at Northwestern Medicine.

Lewis Landsberg Society was created by former chief residents in the Department of Medicine who trained under Landsberg, and connects former Northwestern housestaff in medicine for professional exchange and continuing medical education. Feinberg's annual celebration of research at the medical school, Lewis Landsberg Research Day, was also named in his honor.

"Dr. Landsberg will be remembered for the legacy of his mentorship, his dedicated exuberance and passion for medical education and excellence, and the devotion and deep admiration for him held by the thousands of the trainees he imprinted upon during his tenure. He was the foundation on which the Department of Medicine was built. The culture of excellence, the national reputation, the success we enjoy today in the areas of training, investigation and clinical care can all be traced back to him and his enduring influence," says Douglas Vaughan, MD, the chair and Irving S. Cutter Professor of Medicine.



#### ALUMNI

#### ALUMNI (continued)

John E. Mayo, '63 MD San Diego, California JUNE 17

Jack K. Rasmussen, '64 DDS Draper, Utah JUNE 23

Richard George Stoval, MD, '67, '68, '69 GME New Braunfels, Texas JUNE 14

#### William C. DeWolf, '67 MD Southborough, Massachusetts MAY 24

Madeline J. Seidel Faner, '68 BSDH Greer, South Carolina AUGUST 6

Bradley M. Peterson, '70 MD San Diego, California MAY 11 **Stanley Y. Doida, '70 DDS** Parker, Colorado JULY 19

Gerald Robert Whitson, '75 DDS South Padre Island, Texas JUNE 11

**Craig A. Burtenshaw, '76 DDS** Idaho Falls, Idaho JULY 28 Robert L. McEntyre, '76 MD Bloomington, Illinois JULY 14

James Shen, '83 DDS Las Vegas, Nevada JUNE 25

Paul R. Ernsberger, '85 PhD Cleveland, Ohio

#### FACULTY



Joanne Smith, MD president and CEO of Shirley Ryan AbilityLab Chicago, Illinois SEPTEMBER 6, 2021

Joanne Smith, MD, was the driving force behind

the transformation of care delivery in the field of physical medicine and rehabilitation. As the president and CEO of the No. 1-ranked Shirley Ryan AbilityLab, she envisioned the world's first-ever "translational" research hospital in which physicians, scientists, innovators, technologists and clinicians work together in the same space, surrounding patients, discovering novel approaches and applying (or "translating") research in real time. Smith came to the Rehabilitation Institute of Chicago for her residency in 1988 and never left. In 1992, she became an attending physician and was subsequently tapped to take on various leadership roles of increasing responsibility. In 2006, a few years after earning her MBA from the University of Chicago, she became president and CEO.

Smith was widely recognized as a thought leader. In 2021 and 2019, she was named to *Modern Healthcare*'s exclusive "Top 25 Women Leaders" list. In 2019, she spoke at the Aspen Ideas Festival, the nation's premier public gathering of leaders from around the globe. In 2018, she presented at the first-ever *Wall Street Journal* Future of Everything Festival, an ideas exchange focused on innovations that are transforming the world.

In addition to her leadership at Shirley Ryan AbilityLab, where she managed a team of more than 2,000 clinicians, scientists and staff, she was a faculty member at Feinberg for 25 years.



James R. "Jim" Bartles, PhD professor of Cell and Developmental Biology Skokie, Illinois AUGUST 17, 2021

Feinberg colleagues shared the following tribute:

We are deeply saddened by the passing of our friend and colleague, James (Jim) Bartles.

Jim's unwavering enthusiasm for biology never faded even during his long battle with lung cancer. During the last 11 years with the disease, he showed a level of endurance and courage that many times seemed outright superhuman. We will miss him dearly.

Jim was recruited in 1987 to the Department of Cell Biology and Anatomy by Robert Goldman, PhD. Northwestern became Jim's only scientific home, where he ascended through the ranks becoming full professor in 2007. Initially, his research focused on membrane polarity. These studies set the stage for the identification of a novel actin binding protein family which he named espins. Jim found that espins were widely distributed, especially in the hair cells of the cochlea of the inner ear. This led him to studies of a mutant mouse, which had been maintained as a model for deafness since the early 1940s. Jim discovered that the deafness was attributable to a loss of espin. The rest of his career was dedicated to demonstrating the importance of the espins in the bundling of F-actin in the stereocilia of the mouse hair cells and its relevance to normal hearing and in deafness. Jim's findings significantly impacted our understanding of mechanosensation in the inner ear, and the audiology field leapt forward as the result of his work.

Jim displayed relentless curiosity and a remarkable scientific compass which led to the important discoveries that will carry his name well into the future. He was also a gifted speaker, whether it was to his professional colleagues or to graduate or medical students in course lectures. He dedicated 34 years to Northwestern that impacted generations of students and researchers worldwide.





DAWN S. BROWN, '99 MPT, DPT, HAS BEEN NAMED THE 2021 AMERICAN PHYSICAL THERAPY ASSOCIATION MINORITY FACULTY DEVELOPMENT SCHOLARSHIP AWARD WINNER.

#### MA

#### Onyinyechi U. Enyia Daniel, '12 MA, PhD,

a graduate of the Feinberg Medical Humanities and Bioethics program, was selected as a 2021 Executive Leadership Fellow at America's Health Insurance Plans (AHIP). The AHIP Executive Leadership Program is a comprehensive, yearlong program for senior leaders in the health insurance industry with demonstrated excellent performance, significant industry experience, and a passion for driving change in the industry. She also joined Highmark Health as the vice president of Data and Analytics Strategy and Partnerships. Highmark Health is a large health insurer based in Pittsburgh, Pennsylvania, with members across Pennsylvania, New York, Delaware, and West Virginia. Finally, she was recently appointed to the Sinai Health System Board of Directors. 13

#### MPH

*Melissa Palma, MD, '20 MPH*, has been named as one of 12 physician-leaders to be part of the

inaugural cohort of the Medical Justice in Advocacy Fellowship at Morehouse School of Medicine. AMA-SHLI fellows were selected from over 300 applicants across the United States. The fellows will join a community of advocates to implement health equity projects mentored by multidisciplinary health equity experts. As one of three fellows in training, and the only physician practicing in the Midwest in the inaugural cohort, Palma is excited to apply knowledge learned from her MPH at Northwestern to advocate for meaningful policy and structural changes for health equity and justice in the communities she serves. 2014

#### ΡΤ

Dawn S. Brown, '99 MPT, DPT, has been named the 2021 American Physical Therapy Association Minority Faculty Development Scholarship Award winner. Brown is clinical assistant professor of Physical Therapy in the School of Allied Health and Communicative Disorders at Northern Illinois University, where she is pursuing a doctor of education degree. 15

WRITTEN BY Courtney Burnett, '17 MD

# ACCEPTING THE DIFFICULT GIFTS OF A CANCER DIAGNOSIS

As a primary care and hospital medicine provider in St. Paul, Minnesota, I, like many of my fellow Feinberg alumni, have spent the last year working on the frontlines of the COVID-19 pandemic. But, unlike (hopefully) many of you, I've also spent the last year battling brain cancer.

During my third year of my internal medicine residency at the University of Minnesota, I spent a month studying in Thailand. While there, I developed strange symptoms, includ-

Being a patient is terrifying. Autonomy is gone. You find yourself with a million unanswered questions. ing tingling in my left hand and difficulty swallowing, and ended up diagnosing myself with a brain tumor. Unfortunately, this turned out to be a

malignant brain cancer, requiring two brain surgeries, chemotherapy, and radiation.

Fortunately, I'm still here to tell you my story. I was extremely lucky that cancer did not impact my ability to practice medicine. Instead, I've found that my experience as a patient — particularly in those early days at a hospital in Thailand — became one of my most valuable medical lessons.

The evening after my initial brain scan showed a brain tumor, I was admitted for urgent evaluation and treatment for seizures and brain swelling. Although the medical care system works differently in Thailand than in America, many of the basic logistical aspects were familiar to me. I knew that the physician would order initial labs and vital sign checks, so I was prepared when the lab technician came into my room, stuck an IV in me, and took a few vials of blood without saying a word. I was also mentally prepared to be woken up from sleep every few hours for vital signs, routine monitoring of my heart rate, blood pressure, and oxygen levels.

Every time a familiar activity happened, I felt grateful. OK, I know what this is. I can feel the blood pressure cuff squeezing my arm. I can read my blood pressure measurement; I know this number is OK. When an IV pole was wheeled into my room and fluids were hung next to me, I thought, OK, this is a familiar intravenous fluid. I know why the physician ordered this and I know what effects it will have on me. None of this was explained to me as it was happening.

As a physician, I often make the decision to order labs, place IV lines, start fluids, and do vital sign checks without informing my patients of these decisions. I always inform my patients of critical changes in their treatment plans or test results; however, routine tasks such as those above are as commonplace in medicine as sending an email would be in the corporate world. Physicians do not always remember that for patients, an email feels very different than a blood draw.

I absolutely cannot fathom how terrifying it would be to be a patient, let alone a patient in a foreign country, lying alone in a hospital room undergoing the above procedures without knowing why these things happen, when they happen, or what the results mean. The only reason I felt comfortable in this situation was that it is my day-to-day job.

Being a patient is terrifying. Autonomy is gone. You find yourself with a million unanswered questions, and you spend hours waiting for a physician you just met to tell you the worst news of your life. After this hospital admission, I decided then that when I was back at work, I would try to spend a few



extra minutes with my own patients and provide them with knowledge to feel safe, respected, and understood, rather than afraid and confused.

In the end, one of the greatest difficult gifts of my cancer diagnosis and treatment was actually my experience being a patient. Cancer has taught me more about living, mortality, health, wellness, and patient care than any textbook ever could.

This piece was adapted from Burnett's memoir Difficult Gifts: A Physician's Journey to Heal Body and Mind, available at www. elephantlotusbraintumor.com, Amazon, Barnes and Noble, or at your local bookstore.

#### Northwestern Medicine Through the Years

#### WARD ROUNDS



## 1895-1916

#### **Murphy's Sign**

NORTHWESTERN SURGEON JOHN B. MURPHY, MD, PLAYED A MAJOR ROLE IN MEDICAL — AND U.S. — HISTORY.

#### Top left: The rooms where former president Teddy Roosevelt stayed at Mercy Hospital, Chicago. (Source: Library of Congress)

Bottom left: A photo reprint of the chest X-ray of Roosevelt taken at Mercy Hospital. Murphy made the decision that operating to remove the bullet would do more damage than leaving it.

Inset: An oil portrait of Murphy donated to the medical school by his great granddaughter.

Right: Murphy lecturing to a class of Northwestern medical students

heodore Roosevelt had a penchant for quips. One of his most memorable — "It takes more than that to kill a Bull Moose" — he offered in 1912 after being shot in the chest during a campaign event in Milwaukee. He then famously went on to deliver an 84-minute speech. What transpired afterward, however, is not as well-known and has a significant connection to Northwestern.

After an examination at a Milwaukee hospital, Roosevelt was spirited away to Chicago's Mercy Hospital by John B. Murphy, MD. At the time, Murphy was chief of surgery at Mercy (Northwestern medical school's first teaching hospital) and chair of Northwestern's Department of Surgery.

"He thought there weren't any good doctors in Milwaukee, so he insisted the President be transferred to Mercy and watched him there," said Karl Bilimoria, the John Benjamin Murphy Professor of Surgery and vice chair for quality in the Department of Surgery. After receiving his endowment name, Bilimoria took an intense interest in Murphy and when Mercy was sold to a private equity firm, he acquired a trove of the pioneering surgeon's academic and personal materials, and led the effort to transfer the items to their new home in the Special Collections department of the Galter Health Sciences and Learning Center.

In addition to caring for a sitting U.S. president, Murphy was the first to advocate for removing the appendix in the treatment of appendicitis and developed dozens of surgical and diagnostic techniques (several still bearing his name, including Murphy's sign, a test for differentiating pain in the abdomen). Along with acting as chief of surgery at Mercy from 1895 until his death in 1916, Murphy was president of the Chicago Medical Society, president of the American Medical Association, and a founder of the American College of Surgeons.

Once the collection is processed, Galter will host an exhibit about Murphy, including Bilimoria's contributions, items donated by Murphy's great granddaughter Barbara Miller in 2010, and other historic materials, according to Kristi Holmes, director of Galter (read more about Holmes on page 26). "We are proud to house this wonderful collection," Holmes said. "Dr. Murphy is an impressive figure in the medical school's history and we are delighted to help preserve and share his important legacy for future study and research."



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