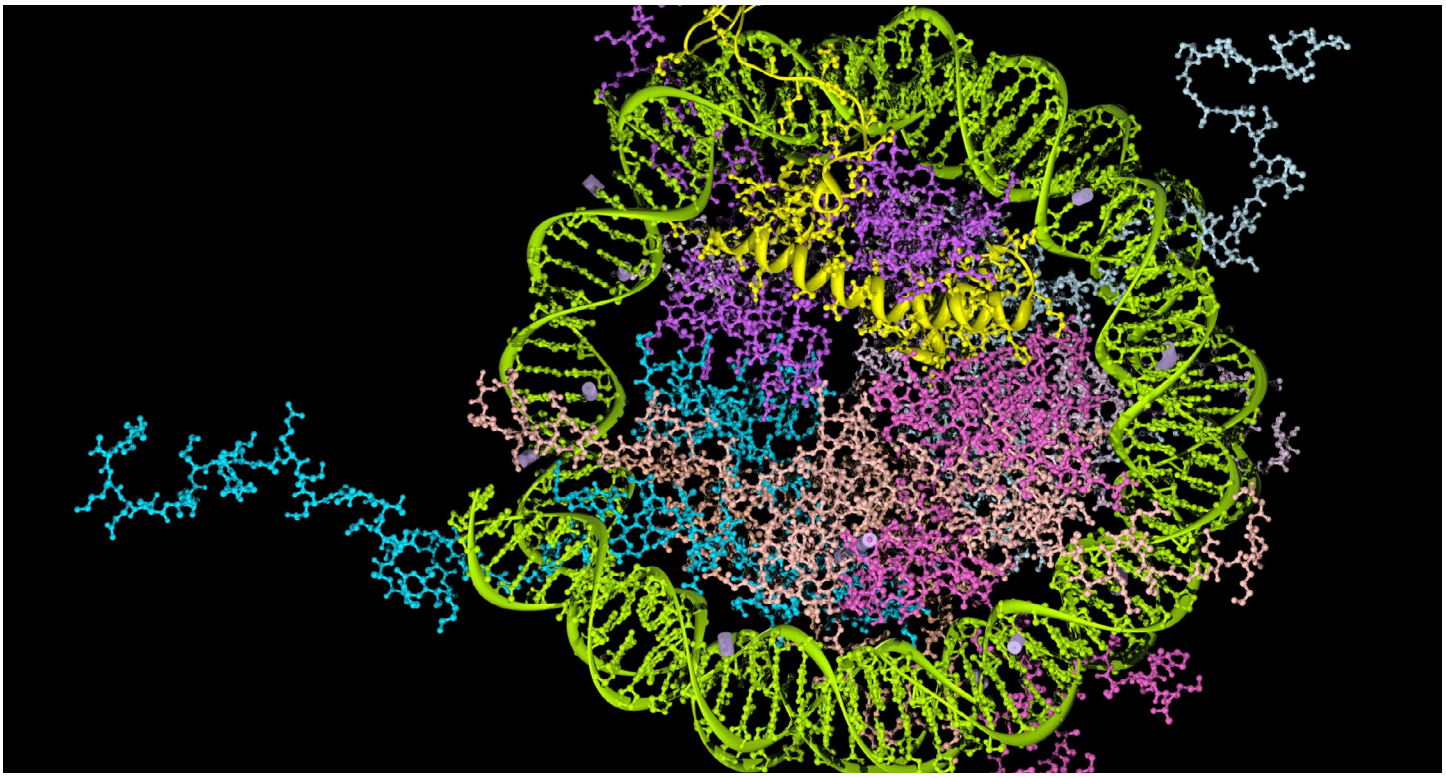
Breakthroughs

Feinberg School of Medicine Research Office

May 2015



Faculty in the Department of Biochemistry and Molecular Genetics are experts in the biochemical, structural, enzymological, molecular, and genetic bases of human disease.

A Growing Team of Scientists Explores the Molecular Basis of Disease

How do the molecular structure and function of genes contribute to disease development? Ali Shilatifard, PhD, Robert Francis Furchgott Professor and chair of the new Department of Biochemistry and Molecular Genetics, is building a team to find out.

"The ultimate goal is a group of very smart and hard-working scientists that focus on different areas, but share the same questions about the molecular basis of disease pathogenesis," said Shilatifard, who joined Northwestern last September.

He says molecular epigenetics, the study of processes that modify gene expression beyond alterations to genetic code, will be a major theme. His own lab, funded by the National Cancer Institute for almost 17 years, examines how translocations—when chromosome pieces break and reattach to others—change gene expression and cause childhood leukemia.

Shilatifard is principal investigator for three NIH R01 grants and a leader in chromatin biology, which encompasses the genetic material of DNA, RNA, and proteins. The faculty in his department, with expertise in the biochemical, structural, enzymological, molecular, and genetic bases of human disease, follow suit.

Professor Wayne Anderson, PhD, studies how proteins from human pathogens look, three-dimensionally. This visualization

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Northwestern Medicine®

Growing Team Explores the Molecular Basis of Disease

(continued from cover page)

explains how proteins identify specific DNA sequences and regulate gene expression, insight that can inform drug discovery.

"The relationship between the structure and function of proteins is where biology, chemistry, and physics meet," Anderson said. "Understanding how a protein recognizes and interacts with other molecules and how changes in sequence—such as mutations—affect it, requires knowing its structure."

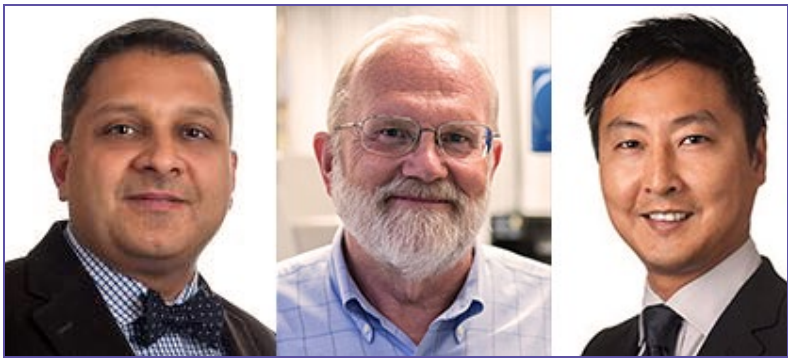
Anderson is director of the Center for Structural Genomics of Infectious Diseases, a consortium with a $5 million yearly contract from the National Institute of Allergy and Infectious Diseases. His team uses x-ray crystallography to characterize the atomic structure of thousands of target proteins. Recently, this included key proteins from *Mycobacterium tuberculosis* and *Clostridium difficile*; the goal is to inspire drug development for the diseases these bacteria cause.

In another project, Anderson is investigating a metabolic system with a possible role in the virulence of *Listeria*. It appears that the bacteria convert polysaccharides such as starch into a form unusable for most other organisms.

"Because *Listeria monocytogenes* is an intracellular pathogen, it may use this same mechanism to divert the host cell energy reserves to its own needs," Anderson said. "It is still exciting to see the structures of the protein that regulate the *Listeria* metabolic system when it's bound to DNA or to the sugar that induces conformational changes in the protein."

With a joint appointment in Neurological Surgery, assistant professor Rintaro Hashizume, MD, PhD, explores how epigenetic activity relates to brain cancer.

Last year, he published a pioneering paper in *Nature Medicine* showing that pharmacologically restoring histone methylation, a process that influences gene expression, can delay growth of an incurable pediatric brain tumor called diffuse intrinsic pontine glioma (DIPG). Focusing on histones, a type of protein that helps package DNA inside cells, is a new approach to combating



From left: Ali Shilatifard, Wayne Anderson, and Rintaro Hashizume.

a disease with a median survival of 10 months.

"More than 250 clinical trials haven't improved survival of patients with DIPG," Hashizume said. "Epigenetic modifications such as histone methylation are increasingly recognized as a major characteristic of pediatric high-grade gliomas."

Hashizume continues to study K27M, the oncogenic mutation that decreases histone methylation in DIPG. He's currently testing the drug inhibitor he identified in combination with radiation; he also hopes to find additional gene alterations that interact with the K27M mutation to spur tumor development.

Demonstrating the interrelated nature of the department's research, Shilatifard has also investigated K27M. In a recent *Science* paper, he suggested additional inhibitors to reverse the effects that Hashizume is now testing in DIPG models.

Shilatifard has already begun to recruit new scientists. In July, Dan Foltz, '02 PhD, from the University of Virginia, will join the department. His lab concentrates on a small region along the chromosome called the centromere that controls chromosome segregation during cell division. When this process goes wrong, cells may end up with too many or too few chromosomes—a hallmark of most cancers.

"We are working to understand how the centromere region is selected and stably inherited across billions, if not trillions of cell generations," said Foltz, who graduated from Feinberg's Driskill Graduate Program in Life Sciences.

"It is a real honor to be invited back to Northwestern to mentor students in the same graduate program that was incredibly important to my development as a scientist," he said.

This September, Panagiotis Ntziachristos, PhD, will also join the faculty. Currently a postdoctoral fellow at New York University, he researches how oncogenic proteins orchestrate aberrant gene expression in pediatric leukemia.

"I'm excited to become part of this vibrant community, where people working on different but complementary aspects of cancer epigenetics will collaborate and generate ideas through a synthetic process," he said.

CONTENTS

Groundbreaking Launches Simpson-Querrey Biomedical Research Center

On May 8, 1925, Northwestern University broke ground on its first Chicago campus building. Exactly ninety years later, the Feinberg community gathered to celebrate its newest expansion, the Louis A. Simpson and Kimberly K. Querrey Biomedical Research Center.

"This is a landmark moment in our history, and one that will impact health for generations to come, here in Chicago and around the country," said Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean at the event. "Today, we build on a legacy of 156 years of innovation and discovery and open a bold new chapter in the history of Northwestern University."

Leaders from the university, Northwestern Medicine, the Ann & Robert H. Lurie Children's Hospital of Chicago, and the city of Chicago joined Dean Neilson at the groundbreaking ceremony for the 600,000-square foot, 14-story building, which will be connected to the Robert H. Lurie Medical Research Center between East Superior Street and East Huron Street. It will house nine laboratory floors dedicated to biomedical research.

"Absolutely nothing is done in the hospital or clinic today that didn't start as an experiment somewhere in the laboratory. Biomedical research informs patient care," Dean Neilson said. "Our building will help draw talented faculty, students, and postdoctoral fellows to Chicago and will provide an opportunity to improve human health."

The Stanley Manne Children's Research Institute will occupy four floors in the Biomedical Research Center.

"Together we're going to be focusing on very important areas for the population that we share: genetics, heart disease, cancer, and neurology, just to name a few," said Pat Magoon, president and CEO of Ann & Robert H. Lurie Children's Hospital of Chicago. "With today's groundbreaking, we're a step closer to achieving that objective."

Click to watch a video about the Louis A. Simpson and Kimberly K. Querrey Biomedical Research Building.

Leaders from Northwestern University, Northwestern Medicine, the Ann & Robert H. Lurie Children's Hospital of Chicago and the city of Chicago celebrated the new Louis A. Simpson and Kimberly K. Querrey Biomedical Research Center.

The building's curved glass exterior and flexible floor plans for laboratories are designed to foster a dynamic, collegial environment that will draw research faculty and students from across Northwestern's Evanston and Chicago campuses and affiliated medical institutions.

In addition to supporting collaborations between scientists at Feinberg and other schools, the building will also add more than 2,500 construction jobs and 2,000 permanent, full-time positions.

"This center cements Chicago's leadership in the world," said Rahm Emanuel, mayor of Chicago. "Chicago as a city now not only has the technology, not only has the talent, not only has the training to create the jobs of today in the healthcare field, but also the cures for the diseases of tomorrow."

Northwestern University President Morton Schapiro highlighted new collaborations made possible by the construction of the new building, and praised the ongoing development of the Chicago campus.

"Our academic medical center in Streeterville is well-positioned to move boldly into the future," President Schapiro said. "Just over the past five years Northwestern Medicine has merged physician groups and opened a fabulous new outpatient care pavilion. Lurie Children's opened a beautiful new hospital, and now RIC is well into construction on a new unbelievably beautiful rehabilitation hospital. These accomplishments serve to strengthen the work Northwestern does and the impact we all have together on the world."

A $92 million naming gift from benefactors Louis A. Simpson and Kimberly K. Querrey enabled construction of the building, which is projected to open in late 2018. It's designed to accommodate up to an additional 15 laboratory floors in the future.

Understanding Thought, Learning, and Memory

Joel Voss, PhD, Assistant Professor of Medical Social Sciences and Neurology

In his research, Joel Voss, PhD, focuses on understanding how the human brain works, particularly how different parts of the brain function to help people think, learn, and remember. Last August, he published a study showing that non-invasively stimulating the brain with magnetic pulses can improve memory. The exciting finding holds promise for patients with memory impairments caused by stroke, early-stage Alzheimer's disease, traumatic brain injury, and many other conditions.

Voss completed his PhD in 2007 from Northwestern University's Interdepartmental Neuroscience PhD Program (NUIN). He joined the Feinberg faculty in 2012 as an assistant professor in Medical Social Sciences and Neurology after completing a postdoctoral fellowship at the Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign.

Q&A

What are your research interests?
I use cognitive and clinical neuroscience approaches to study the organization of memory in the human brain and the nature of memory disruptions in neurologic and neuropsychiatric conditions. My laboratory also develops novel methods for modifying memory abilities using nonsurgical brain stimulation. For instance, in our recent research, we have shown that it is possible to use nonsurgical stimulation to enhance the function of the hippocampus, a memory structure deep within the brain, thereby increasing people's learning ability.

What is the ultimate goal of your research?
The goal is to advance the understanding of memory disorders and to develop targeted interventions to improve function in individuals with debilitating memory impairments.

How did you become interested in this research?
Memory is a fascinating ability, and researching it has captivated me for quite some time. While working with individuals with debilitating memory disorders during my postdoctoral fellowship, I learned the high cost of memory impairment to life quality. Memory is an essential part of life and central to our concepts of self-identity. Memory loss is therefore practically and emotionally devastating for victims and their families, and there are currently no effective treatments for it. Better understanding of memory disorders and development of targeted interventions has since been my focus.

How is your research funded?
My research is funded by R01 and R00 awards from the National Institute of Neurological Disorders and Stroke, the National Institute on Aging, and the National Institute of Mental Health (NIMH).

My laboratory is also funded by a Silvio O. Conte Center for Neuroscience Research from NIMH that allows us to pursue collaborative translational research on memory with other laboratories at Boston University, Massachusetts Institute of Technology, University of Illinois, and the Icahn School of Medicine at Mount Sinai.

Finally, we have also received generous support from the Brinson Foundation and the Lynn Sage Cancer Research Foundation.

Where have you recently published papers?
In the last year we have published our research in *Science*, *Neuron*, *The Journal of Neuroscience*, *Cerebral Cortex*, and *Hippocampus*, among others.

What resources at Northwestern have been helpful for your research?
Our research is heavily dependent on MRI-based measures of brain function, and we could not perform this research without the excellent neuroimaging resources provided at the Center for Translational Imaging.

Medicine From a Different Angle

Jennifer Felten, Associate Director of Research Administration

Where are you originally from?
I am originally from New Jersey, but I moved several times as a child, including Saudi Arabia, until we settled here in Chicago when I was in middle school. I consider Chicago my hometown.

What is your educational background?
I was a psychology major, pre-medicine, at the University of Illinois. My original goal was to go to medical school and although I loved what I was learning, my heart wasn't 100 percent into going to medical school. I changed course and obtained my Master of Science degree from Rush University in health systems management, which allowed me to work in medicine but from a different angle.

Please tell us about your professional background.
When I first graduated, I worked for a couple of years in consulting with a small firm that has since been absorbed by Navigant. Since starting at Northwestern over 10 years ago, I've been a division administrator in Hepatology and Allergy, and am now an associate director of research administration in the Department of Medicine. It has been great to have various positions that have exposed me to each of our missions in medicine.

Why did you choose to work at Northwestern?
I first wanted to work at Northwestern because of its great reputation. Once I started to dive into a job search, I met people who really enjoyed working here, so I thought it was a win-win.

How do you help scientists at the medical school?
A lot of my work centers around grant accounts and their management. Research administrators help PIs to get their grants properly submitted and strive to manage them in a fiscally responsible and compliant manner once awarded. When PIs feel well-supported and confident that their grants are well-managed, they can free their minds to focus on science, which is exactly what they should be doing.

What is your favorite part of the job?
In my current role I am often a step removed from working one-on-one with faculty, but I always feel a part of their team. Additionally, I enjoy training and onboarding new staff at all levels. To be effective at these roles, there is an incredible amount of minutia to know, and it is satisfying when I can help people to get through that to become independent and successful.

What exciting projects are you working on?
In the Department of Medicine, we are in the process of implementing ongoing, relevant and hands-on training to provide tools and knowledge to help administrators run their divisions. Increasingly staff have to do "more with less" and therefore it is important to focus on staff development so that people feel supported in each of their roles. I am working on our first session for April, which will be on Cognos Reporting.

What do you do in your spare time?
My husband and I and our kids love to entertain. We really enjoy cooking and hanging out with friends and family and our home is always full. In my free time I like to read and exercise. We also try to travel as much as possible. I love researching what to do on vacation.

Northwestern Creates $200,000 Prize in Medical Science

Northwestern University has created a $200,000 Mechthild Esser Nemmers Prize in Medical Science. The inaugural prize will be awarded in early 2016 and every other year thereafter.

Candidacy for the 2016 Nemmers Prize in Medical Science is open to physician-scientists whose body of research exhibits outstanding achievement in their disciplines as demonstrated by works of lasting significance.

The 2016 recipient of the Nemmers Prize in Medical Science will deliver a public lecture and participate in other scholarly activities at Northwestern.

Nominations for the prize will be accepted until Sept. 15, 2015. Nominations from experts in the field and institutional nominations are welcome; direct applications will not be accepted. Individuals of all nationalities and institutional affiliations are eligible except current or recent members of the Northwestern faculty and recipients of the Nobel Prize.

Nominations can be submitted at www.feinberg.northwestern.edu/nemmers.

A Plan to Pay Science Forward

Lizzie Aguiniga, Driskill Graduate Program in Life Sciences

Lizzie Aguiniga, a fifth-year PhD student in the Driskill Graduate Program in Life Sciences (DGP), studies in the department of Urology.

Aguiniga's love for science blossomed while spending the summer after high school in a research program at El Paso Community College, and attending the Annual Biomedical Research Conference for Minority Students. Inspired by the energy of the conference and a talk given by Mina Bissell, PhD, from the Lawrence Berkeley National Laboratory at the conference, Aguiniga knew she wanted to be a scientist.

She earned a Bachelor of Science degree from the University of Texas at El Paso and following college graduation she joined the Post Baccalaureate Research Education Program (PREP) at the University of New Mexico before coming to Northwestern.

Q&A

Where is your hometown?
I grew up in El Paso, Texas, it's part of the Chihuahua Desert and there is always a lot of sunshine there. It is also a much smaller city, and I really miss the slightly slower-paced lifestyle. I go back whenever I get the chance to visit my family and friends. I do absolutely love Chicago, though. I love being able to bike along the lakefront to school on warm days.

What are your research interests?
I really love the idea of doing research that translates to a clinical problem. I am interested in how microbes interact with the host and can alter immune responses. In the past I have worked on mutating the lipopolysaccharide of a urinary tract infection (UTI) isolate and used the mutants to characterize adaptive response skewing to make the host more susceptible to reinfection. It really fascinating to see how a small alteration can cause great differences in the host immune response.

What exciting projects are you working on?
The Klumpp lab works on several different projects related to complications with the urinary tract, including UTI and interstitial cystitis. I have worked on both during my time here. I am currently focusing on how an inflammatory lipase can alter lipids to induce the expression of a stress response hormone (corticotropin-releasing factor) to ultimately promote bladder dysfunction and pelvic pain. I am also characterizing the transcription factors that regulate CRF gene expression. It is very fascinating work, and I am very glad that my research has clinical application.

What attracted you to the PhD program?
I chose to do my PhD at Northwestern because I really liked that the DGP program was an umbrella program. At the time I was pretty sure I wanted to work in the department of Microbiology/Immunology but I also wanted to explore other areas of research; this program allowed me to do that.

Also there were many different faculty members whose research I was interested in that were under the DGP. I felt that when I had any questions about the program the administration would contact me almost immediately to answer any of my concerns. I felt that the administration really took the time to address any questions or concerns I had.

What has been your best experience at Feinberg?
Feinberg is so friendly and collaborative, and that allows for a great learning environment. On several occasions I have done experiments outside the area of expertise of my lab, and have had a positive response from other labs to help teach me the techniques I need to learn. You can always send out an email to borrow reagents or a piece of equipment from other labs. There is a very strong sense of community at Northwestern, especially among the students.

What do you do in your free time?
I really enjoy being outdoors. I try to bike a lot during the summer and just get as much sunshine as possible. I have also picked up running recently, and I love running along the lakefront and the museum campus. There are such amazing scenic views around here to enjoy! Chicago is culturally diverse, so I also like to try different types of foods and check out different neighborhoods around the city.

What are your plans for after graduation?
Ultimately I want to work in outreach. I have participated in several programs geared toward recruiting minorities into the STEM careers, and I really want to pay that forward. I think many students are not aware of the opportunities available to pursue higher education, and it is very important to help educate them about the different resources and financial opportunities available.

Research in the News

***The New York Times* April 27**
Keep moving to stay a step ahead of arthritis
Jungwha Lee's research was featured.

***Chicago Tribune* April 27**
Researchers warn of binge drinking by teens at Lollapalooza
Robert Tanz and Sarah McAndrew's research was featured.

***Chicago Tribune* April 27**
FDA to require new information for prescribing medications during pregnancy
Katherine Wisner was featured.

***The Atlantic* April 22**
The man who couldn't stop giving
Jordan Grafman's research was featured.

UPI April 17
Walking improves health outcomes for prostate cancer survivors
Siobhan Phillips' research was featured.

***The New York Times* April 15**
FDA approves Amgen drug to treat heart failure
Clyde Yancy was quoted.

***US News & World Report* April 15**
When men get the baby blues
Craig Garfield's research was featured.

***The Wall Street Journal* April 6**
New thinking on sinus infections
Anju Peters was quoted.

FOX News (National) April 2
Scientists find potential therapy to suppress deadly brain cancer genes
Alexander Stegh and Chad Mirkin's research was featured.

Web MD April 1
More survive child cancer; health problems persist
Siobhan Phillips' research was featured.

***Boston Globe* April 1**
Private social network 'Koko' to give people with depression a boost on bad days
Stephen Schueller's research was featured.

Yahoo! News April 1
Questions persist about sexual effects of baldness drug
Steven Belknap's research was featured.

More media coverage available online.

Northwestern University
NUCATS
Clinical and Translational Sciences Institute

NUCATS Corner

Galter Health Sciences Library Enhances Evaluation, Impact and Visualization Services

The Galter Health Sciences Library is committed to digital innovation and has released a number of new and enhanced leading-edge services to meet the research and scholarly needs of Feinberg School of Medicine faculty, staff, students, and residents. The library now houses the Research Computing Cluster, a group of six computers dedicated to handling statistical and bioinformatics workflows and loaded with specialized analytical, statistical, and visualization software. Researchers can crunch preliminary data for grant proposals, make figures for talks and manuscripts, and try new ways of thinking about data. If you're looking for individualized assistance, librarians are available for research consultations, literature searches, and training in the use of resources and databases such as EndNote, PubMed, Creating Posters with PowerPoint, and NIH Public Access Policy and Publication Management with MyNCBI.

The Galter Library can also help you better understand the impact of your research. The Library's Metrics and Impact Core has expertise in bibliometrics, data visualization, continuous improvement, information systems and alternative metrics. It provides extensive advisory services for researchers, groups or departments on topics such as: developing successful publishing strategies, managing or tracking publications, maintaining an impactful online identity, and more. In addition, the Library can help researchers describe or quantify their scholarly contribution and research impact to meet the needs of the new NIH biosketch requirement using publication tools, metrics, and resources.

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Sponsored Research

PI: Elizabeth McNally, MD, PhD
Director, Center for Genetic Medicine,
Elizabeth J. Ward Professor of Genetic Medicine,
Professor of Cardiology and Biochemistry and Molecular Genetics

Sponsor: National Institute of Neurological Disorders and Stroke

Title: "Regulating Fibrosis and Muscle Growth in the Muscular Dystrophies"

Muscular dystrophy is a genetic disease, and one of the most severe forms of muscular dystrophy is Duchenne Muscular Dystrophy (DMD). DMD affects boys, causing them to lose the ability to walk by age 12, and a subset of the limb girdle muscular dystrophies have in common disruption of the dystrophin protein complex. Disrupting the dystrophin complex causes the plasma membrane of muscle membranes to become weak, producing loss of myofibers, and replacement of the muscle with fibrosis or scarring. Multiple lines of evidence point to fibrosis as a driver of muscular dystrophy pathology.

McNally and her colleagues hypothesize that fibrosis provides a scaffold that promotes an unfavorable cytokine profile that further damages muscle. They further hypothesize that the primary components of the unfavorable cytokine profile are TGF-β and the related TGF-β family member myostatin. TGF-β family members regulate fibrosis, and myostatin leads to reduced muscle mass and regeneration. The group is studying the means by which TGF-β and myostatin are normally sequestered by the matrix and held unavailable for receptor engagement and signaling and to determine how to promote inactivation of TGF-β and myostatin in muscular dystrophy.

She and her team will also demonstrate necessary proteolytic cleavage steps for release and processing of myostatin and related molecules, and the degree to which soluble receptors can be effective in treating muscular dystrophy.

They will also sequentially assess the distinct intracellular signaling pathways that are triggered by TGF-β and myostatin and test whether inhibiting these pathways improves muscle function and pathology in muscular dystrophy.

McNally and two other established investigators (Se-Jin Lee, MD, PhD, of Johns Hopkins University, and Jeffery Molkentin, PhD, of Cincinnati Children's Hospital Medical Center) are leading the investigation, and they form a distinctive team where their combined expertise defines the TGF-β/myostatin pathway for therapeutic intent in muscular dystrophy.

McNally said, "It's an exciting time for muscular dystrophy research. There has been great progress in understanding how these muscle diseases develop, and many new ideas are in preclinical testing. It is a time of great hope for patients and families dealing with muscle disease."

McNally serves as an advisor to the Muscular Dystrophy Association, now headquartered in Chicago, and Parent Project Muscular Dystrophy.

PI: Peter Penzes, PhD
Professor of Physiology and Psychiatry and Behavioral Sciences

Sponsor: National Institute of Mental Health

Title: "Postsynaptic Roles of Ankyrin "

Recent evidence implicates glutamatergic synapses as key pathogenic sites in psychiatric disorders.

Common and rare variants in the ANK3 gene, encoding the protein ankyrin-G, have been associated with bipolar disorder, schizophrenia, autism spectrum disorders, and intellectual disability. While a number of studies suggested that ankyrin-G plays a role in neuronal function beyond its well-characterized actions at the axon initial segment, its functions in mammalian glutamatergic synapses have not been investigated.

Penzes' preliminary studies show for the first time that ankyrin-G is integral to AMPAR-mediated synaptic transmission and to the maintenance of spine morphology. Using super-resolution microscopy, he found that ankyrin-G forms distinct nanodomain structures within the spine head and neck. At these sites, it differentially modulates mushroom spine structure and function. Neuronal activity promotes ankyrin-G accumulation in distinct spine subdomains, where it differentially regulates activity-dependent spine structural plasticity. These preliminary findings implicate subsynaptic nanodomains containing a major psychiatric risk molecule as having location-specific functions, and opens novel directions for basic and translational investigation of psychiatric risk molecules.

The functions of ankyrin-G in spines of glutamatergic synapses in the brain have not yet been investigated. In this project,

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Sponsored Research

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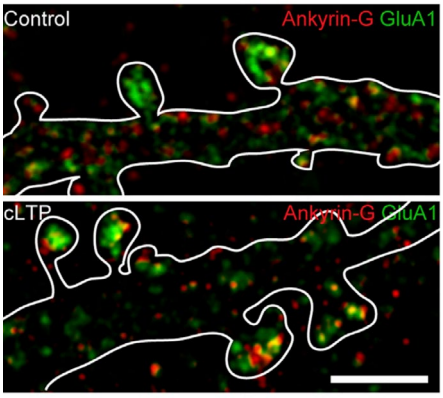
Penzes' team is using super-resolution and in vivo two-photon microscopy, in combination with biochemical, electrophysiological, molecular, and mouse model approaches, to test the hypotheses that different ankyrin-G isoforms play differential and integral roles in dendritic spine maintenance and glutamatergic synaptic transmission and plasticity.



Ankyrin-G accumulates in dendritic spines when the spines enlarge (bottom), compared to control (top), shown using Penzes' super-resolution imaging method. Ankyrin-G is a protein encoded by ANK3, a gene closely associated with bipolar disorder risk.

The team will test these hypothesis in the following aims: regulation of glutamatergic postsynaptic structure and function by ankyrin-G isoforms; mechanisms of regulation of postsynaptic ankyrin-G in spiny synapses; and lastly, regulation of spiny synapse remodeling and function by ankyrin-G isoforms in the intact brain.

Welcome New Faculty

Jeffrey Savas, PhD, joins as assistant professor of Neurology, Medicine, Pharmacology, and Neurological Surgery.

He earned his Doctor of Philosophy degree in biochemistry and structural biology from New York University School of Medicine, National Institutes of Health Graduate Partnership Program, and during graduate school was an adjunct instructor of chemistry at Brooklyn College of the City University of New York. He most recently completed his postdoctoral training as a Ruth L. Kirschstein National Research Award fellow in proteomics at the Scripps Research Institute and was a visiting scholar in neurobiology at the University of California–San Diego.

Savas' research interests are centered on elucidating the pathogenic mechanisms which drive synaptopathies and proteopathies in the mammalian nervous system. Ultimately, his goal is to identify keystone proteins and proteomes as potential therapeutic targets to ameliorate neurodevelopmental and degenerative diseases.

Funding

Advanced Development of Informatics Technology (U24)

More information

Sponsor: Department of Health and Human Services, National Institutes of Health, National Cancer Institute

Submission deadline: June 18
Upper Amount: $2.5 million

Synopsis: This opportunity invites cooperative agreement applications for advanced development and enhancement of emerging informatics technologies to improve the acquisition, management, analysis, and dissemination of data and knowledge in cancer research. If successful, these technologies would accelerate research in cancer biology, cancer treatment and diagnosis, cancer prevention, cancer control and epidemiology, and/or cancer health disparities. This FOA is one component of the NCI's Informatics Technology for Cancer Research (ITCR) Initiative whose central mission is to promote research-driven informatics technology development.

NINDS CREATE Devices: Translational and Clinical Studies to Inform Final Device Design (UH2/UH3)

More information

Sponsor: Department of Health and Human Services, National Institutes of Health, National Institute of Neurological Disorders and Stroke

Submission deadline: August 11
Upper Amount: $1.5 million

Synopsis: This opportunity encourages applications to pursue translational and clinical studies for therapeutic devices to treat neurological disorders. The program will utilize a cooperative agreement mechanism to support the submission of an Investigational Device Exemption or IRB approval for a Non-Significant Risk study and the following clinical study. It is expected that the clinical study will inform a final device design that would have to go through most, if not all, of the preclinical testing on the path to more advanced clinical trials and market approval. This program also supports development of a device to test scientific hypotheses that are not feasible or practical to conduct in animal models, but are critical to enable next-generation devices. Activities supported in this program include implementation of clinical prototype devices, preclinical safety and efficacy testing, design verification and validation activities, pursuit of regulatory approval for the clinical study, and a small clinical study.

View more funding opportunities.

High Impact Factor Research

March 2015

Albrecht LV, Zhang L, Shabanowitz J, Purevjav E, Towbin JA, Hunt DF, **Green KJ**. GSK3- and PRMT-1-dependent modifications of desmoplakin control desmoplakin-cytoskeleton dynamics. *Journal of Cell Biology*. 2015 Mar 2;208(5):597-612.

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Larsen JB, Jensen MB, Bhatia VK, Pedersen SL, Bjørnholm T, Iversen L, Uline M, **Szleifer I**, Jensen KJ, Hatzakis NS, Stamou D. Membrane curvature enables N-Ras lipid anchor sorting to liquid-ordered membrane phases. *Nature Chemical Biology*. 2015 Mar;11(3):192-4.

Norton JJ, Lee DS, Lee JW, Lee W, Kwon O, Won P, Jung SY, Cheng H, Jeong JW, Akce A, Umunna S, Na I, Kwon YH, **Wang XQ**, Liu Z, Paik U, Huang Y, Bretl T, Yeo WH, Rogers JA. Soft, curved electrode systems capable of integration on the auricle as a persistent brain-computer interface. *Proceedings of the National Academy of Sciences U S A*. 2015 Mar 31;112(13):3920-5.

Radovic-Moreno AF, Chernyak N, Mader CC, Nallagatla S, Kang RS, Hao L, Walker DA, Halo TL, Merkel TJ, Rische CH, Anantatmula S, Burkhart M, **Mirkin CA**, Gryaznov SM. Immunomodulatory spherical nucleic acids. *Proceedings of the National Academy of Sciences U S A*. 2015 Mar 31;112(13):3892-7.

Weinberg SE, Sena LA, Chandel NS. Mitochondria in the regulation of innate and adaptive immunity. *Immunity*. 2015 Mar 17;42(3):406-417.

Help Feinberg Track Journals

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

Visualization Experts Offer New Tools for NU

A picture is worth a thousand words, but translating groundbreaking medical research into something visual can be a difficult task.

From illustrations to animations and interactive tools, a team of experts at Northwestern Visualization Services is working to help Northwestern scientists explore, quantify, and communicate their complex scientific data in novel new ways.

Matt McCrory, lead visualization engineer at Northwestern Visualization, said his team can help create visuals for researchers in all areas of science, and for any desired audience—whether it be fellow researchers, students, or the general public.

"The goal of our service is to provide scientists with creative ways to explore and present their data without taking time away from what they do best—research," McCrory said. We spend a lot of time during the development process making sure the visuals we're creating are accurate and truly embody the research presented."

Northwestern's visualization services team is comprised of a group of artists and technicians with industry experience and the expertise to create illustrations, animations, and interactive tools from real, simulated, or conceptual data.

To begin working with Northwestern Visualization Services, contact Matt McCrory at 847-467-0861.

Cover illustrations are among the offerings of Northwestern's Visualization Services team.

Calendar

Wednesday, May 27

Lurie Cancer Seminars

"Complementary Discoveries: PNH, aHUS and APLS," by Robert Brodsky, MD, Johns Hopkins Kimmel Comprehensive Cancer Center.

Time: Noon to 1 p.m.
Location: Lurie Medical Research Building — Searle
303 E. Superior St. (Chicago campus)
Contact: cancer@northwestern.edu
More information

Thursday, May 28

Immunology and Microbial Pathogenesis Symposium

Presented by the NULaBS Immunology and Microbial Sciences Cluster program, co-hosted with training grant programs in Allergy-Immunology and Immunology and Microbial Pathogenesis. The day-long symposium will feature lectures and a poster session.

Time: 9 a.m. to 4 p.m.
Location: Lurie Medical Research Building — Hughes
303 E. Superior St. (Chicago campus)
Contact: k-satchell@northwestern.edu
More information

Friday, May 29

Department of Physiology Seminar

"Transcriptional and Epigenetic Mechanisms of Depression," by Eric Nestler, MD, PhD, Icahn School of Medicine at Mount Sinai.

Time: Noon to 1 p.m.
Location: Lurie Medical Research Building — Baldwin
303 E. Superior St. (Chicago campus)
Contact: d-daviston@northwestern.edu
More information

Monday, June 1

Inaugural SQI Distinguished Lecture

"Smart Biomaterials for Diagnosis of Diseases and Improvement of the Quality of Life of Patients," by Nicholas Peppas, ScD, University of Texas at Austin.

Time: 1:30 to 2:30 p.m., reception to follow
Location: Lurie Medical Research Building — Baldwin
303 E. Superior St. (Chicago campus)
Contact: jill-johnson@northwestern.edu
More information

More Events
Event organizers are encouraged to submit calendar items on Plan-It Purple for consideration. Please contact the Research Office with further questions.

NIH News

Lasker Clinical Research Scholars
The NIH, in partnership with the Lasker Foundation, has announced the Lasker Clinical Research Scholars Program, an "intramural-extramural" partnership to nurture the next generation of clinical researchers. The program supports a small number of clinical researchers in the early stages of their careers to promote their development to independent positions. Successful candidates are designated as Lasker Clinical Research Scholars.

21st Century Cures
The House Energy and Commerce Committee released a new discussion draft of its 21st Century Cures legislation. The draft legislation proposes to authorize and provide increased funding for the NIH, including $10 billion over the next five years in mandatory appropriations through an NIH Innovation Fund.

Minority Health and Health Disparities
The National Institute on Minority Health and Health Disparities issued a Request for Information soliciting input and guidance on NIH's vision for the science of health disparities research for the next decade. Responses are due by July 31.

More ASSISTance Options for Submitting NIH Applications
NIH recently made ASSIST (the Application Submission System and Interface for Submission Tracking) available as an option for submitting R01 applications, as well as more individual career (K) award applications.

ASSIST is a web-based system that was developed by NIH in partnership with grants.gov to address common application submission challenges identified by the NIH community.

Read more about ASSIST submission options.

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