Breakthroughs

Feinberg School of Medicine Research Office

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Julius Dewald, far right, directs the NACT-3D robot, which can measure a stroke victim's reaching ability in virtual environments.

The Rise of Robotic-Assisted Therapy

Reaching into the refrigerator for a carton of milk can be nearly impossible for a person recovering from stroke whose arm uncontrollably curls to her chest. But new technology developed by Northwestern Medicine scientists is making such tasks possible, with robotic devices and computer-assisted therapies that go far beyond the traditional rehabilitation therapies often prescribed to physical therapy patients.

"I think the use of more technology is going to be mandatory in physical therapy, because it quantifies the real deficits and shows whether an intervention changes movement impairments," said Jules Dewald, PhD, chair of Physical Therapy and Human Movement Sciences at Northwestern University Feinberg School of Medicine and professor of Biomedical Engineering at the McCormick School of Engineering and Applied Sciences. "Plus, as medical care gets more expensive, we may need to develop devices that a person can take home and use rather than having to keep going to a place followed by a therapist at a distance as opposed to in person."

Stroke is the leading cause of disability in adults and cerebral palsy is the leading cause of disability in children. In highly prevalent unilateral brain injuries – when one hemisphere of the brain is affected – people lose the ability to control joints one at a time at the opposed arm and leg.

Dewald's team is using robotics to create virtual environments to help these patients move in ways that weren't possible before. Their ultimate goal is to come up with smarter ways

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Northwestern Medicine®

The Rise of Robotic-Assisted Therapy

(continued from cover page)

to reduce the level of movement impairment in adults and children.

"Most people can lift their arm and control their elbow, wrist and fingers, even though they're activating their shoulder muscle to lift their arm," Dewald explained. "This is not the case in a person with stroke or cerebral palsy."

The more patients drive their shoulder muscles when lifting the arm, such as reaching for something, the less control they have in the rest of the arm, causing their arm to curl against their chest. Dewald and his team built a robotic device to address this impairment and help patients regain reaching ability and some basic hand function. Once a patient's arm is strapped into the device, the device measures forces, movements and the location of the arm. A sensor in the device measures the weight of the individual's arm, so weight can be taken away or added. His team discovered that when a person's arm was made weightless – as if it bobbing in space – the person is miraculously able to reach out.

To test the device, Michael Ellis, DPT, assistant professor, and Dewald saw subjects with moderate to severe chronic stroke three times a week for eight weeks. During one-hour sessions, they practiced reaching with assistance of the robotic device. As patients progressed and were able to reach out more, the scientists progressively added more weight to their arm, resulting improved outcomes.

Now, Dewald said his team is ready to start testing this device with more patients and start doing tests earlier on in a person's recovery from a stroke. "If we can intervene early on, we think it can be quite a game changer," he said.

This successful research has also led his team to develop smaller and lighter models that subjects could use in daily rehabilitation or take home with them.

"Our vision is if we can deploy this to clinics or homes, we will have a greater impact and reach more individuals with stroke

Dewald demonstrates one of his devices to King Willem-Alexander of the Netherlands during a royal visit to Northwestern.

and also allow us to go a step beyond from what we've done in terms of getting this to the clinic," said Ana Maria Acosta, PhD, associate professor, who is investigating non-traditional ways to motivate and improve the outcomes of patients in rehabilitation.

Dewald and Jun Yao, PhD, associate professor, also use a high-density electroencephalography (EEG) to record the electrical activity of the brain, to better understand how it responds to robotic interventions. They placed 160 electrodes or more onto study subjects' heads and found that as the subjects moved their right arm, their left hemisphere became active. In patients with stoke where just one hemisphere has been affected, the team observed that those with greater losses in neural pathways will switch over more quickly to use the non-affected hemisphere. They hypothesized that a person will use whatever resources they still have from the affected hemisphere where the stroke took place before moving on to use pathways from the non-affected hemisphere. While observing brain activity during the robotic device reaching exercise, they obtained early evidence that over time, people used these pathways in the affected hemisphere more effectively.

By using high density EEG, Dewald's group also discovered the time of brain injury has a big impact on the deficits seen in children with cerebral palsy, a finding that may help improve existing therapies. They were able to separate children with cerebral palsy into three different categories: prenatal, during birth and post-natal. They learned that while post-natal children with cerebral palsy are similar to adults with stroke, pre-natal injury results in more of a mirroring effect where when the right arm moves, so does the left. Children with injury during birth seemed to have a combination of the two symptoms.

These kinds of breakthroughs have the potential to help physical therapy patients of all ages regain better control of their bodies and improve their quality of life. It also helps to advance the field of physical therapy through technology and methods that go far beyond traditional approaches.

"A therapist could dream up 100 exercises and think they're a better therapist because they can come up with more exercises as opposed to which exercises matter and why. So we use technology as a tool to study a movement problem and then come up with a more effective way to intervene based on a better understanding of the underlying science," Dewald said.

CONTENTS

Investigating New Brain Tumor Therapies

C. David James, PhD, Neurological Surgery, Biochemistry Molecular Genetics

For 30 years, C. David James, PhD, has focused on understanding how gene alterations lead to malignant brain tumors – research he uses to identify novel treatments for patients.
In one recent paper published in *Nature Medicine*, he and colleagues demonstrated in mice that a small molecule inhibitor can reverse a histone mutation found in the majority of patients with diffuse intrinsic pontine, delaying tumor growth and prolonging survival.

The goal of his research is to identify therapeutic agents and treatments that improve outcomes for brain tumor patients.

James joined the Feinberg faculty in 2014 from the University of California San Francisco. He is a professor of Neurological Surgery and Biochemistry and Molecular Genetics, vice chair of research in the Department of Neurological Surgery and a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

Q&A

What are your research interests?
I have a longstanding interest in the study of the molecular, cellular and biological aspects of human brain tumors. In association with this interest, I have developed a number of unique model systems based on the serial propagation of human brain tumors as subcutaneous xenografts in immunocompromised mice. This approach to tumor cell propagation has been shown to better preserve tumor characteristics as manifested in patients than tumor cell propagation in cell culture. In association with the development of these models, my laboratory utilizes numerous techniques to investigate brain tumor growth and response to novel agents that are administered singularly or in combinations to animal subjects, following subcutaneous tumor transfer to the brains of immunocompromised mice.

What types of collaborations are you engaged in across campus (and beyond)?
Of the collaborations I've become involved in with Northwestern faculty, I'm especially enthusiastic about interactions between our pediatric brain tumor research group and the lab of Ali Shilatifard, PhD, chair of Biochemistry and Molecular Genetics. Pediatric brain tumors are presenting some interesting opportunities to study the importance of histone modifications in cancer development and Shilatifard is a renowned expert on the role of histone modifications in regulating gene expression. Through our interactions with Shilatifard and his laboratory, I feel as though I'm getting an advanced education in an area of cancer molecular biology that is emerging as a subject of keen interest in the development of novel therapeutic approaches for improving cancer patient treatment outcomes.

How did you become interested in this area of research?
As a graduate student, I studied c-myc oncogene translocations in Burkitt lymphoma and became hooked on investigating how somatic mutations cause normal cells to become tumor cells. I carried that interest into my postdoctoral training, where there were substantial resources for studying gene alterations in brain tumors. Little was known about brain tumor gene alterations at that time – it was 1986. My subsequent career path has therefore been a result of an intersection between my inherent interests, resource availability and the opportunity for discovery in studying gene alterations in an organ system for which little was known about the cancer-associated genetic etiology.

How is your research funded?
I have received research support from several philanthropic organizations, including the Pediatric Brain Tumor Foundation, the James S. McDonnell Foundation, Voices Against Brain Cancer and Accelerate Brain Cancer Cure. In addition, my research has been continuously supported by one or more NIH grants since 1991, with current NIH funding to extend into 2021.

What do you enjoy about teaching and mentoring young scientists in the lab?
The mentor-mentee relationship is bidirectional with respect to learning. The energy, inquisitiveness and creative thinking of young investigators stimulates my own thinking, such that, at the end of the day, I feel I learn as much from trainees as they learn from me. By continually being asked the question of "Why?" from young investigators, I have to constantly reevaluate the basis of my own thinking and opinions, with the end result being the growth and continuous evolution of my understanding regarding cancer origin, progression and treatment.

Twelfth Annual

Lewis Landsberg Research Day

Date: Thursday, April 7, 2016

SCHEDULE OF EVENTS

1:00 p.m. **OPENING CEREMONY AND KEYNOTE PRESENTATION**
Hughes Auditorium
Robert H. Lurie Medical Research Building

2:15 p.m. **POSTER SESSION**

Public Health & Social Sciences and Clinical Research
Third Floor, Feinberg Pavilion
Northwestern Memorial Hospital

Basic Science and Education Research
Patrick G. and Shirley W. Ryan Family Atrium
Robert H. Lurie Medical Research Building

4:15 p.m. **AWARDS CEREMONY AND RECEPTION**
Hughes Auditorium
Robert H. Lurie Medical Research Building

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Northwestern Medicine®
Feinberg School of Medicine

Helping Scientists Navigate the IRB

Denise Roe, MS, Executive Director of Instructional Review Board

Where are you originally from?
I am originally from a small town just outside of Flint, Michigan.

What is your educational background?
During my junior and senior year of high school, I attended Mott Community College as a part of a dual enrollment program offered through my high school. This allowed me to get a head start so I could finish my practical nursing coursework after graduation.

After working almost 19 years as a Licensed Practical Nurse (LPN) and taking a few college courses, as my schedule would permit with a full-time job and a growing family, I entered into an accelerated degree completion program designed specifically for working professionals at Trevecca Nazarene University (TNU) in Nashville.

Just prior to completing my Bachelors of Arts in human relations and management, I applied to and was accepted into a TNU graduate program in management. In addition to formal degree programs, I have completed several leadership and management courses at Vanderbilt University Owen Graduate School of Business.

Tell us about your professional background.
I started my career as an LPN at Flint Osteopathic Hospital, now Genesys Healthcare. In 1992, I joined Vanderbilt University in Nashville. While at Vanderbilt I developed a deep passion for research and during the last several years of my career there, I had the privilege of leading their human research protection program.

In 2010, I accepted an opportunity to lead the human research protection program at Spectrum Health, a large healthcare system based out of Grand Rapids, Michigan. This move allowed me to return to the Midwest and be closer to my aging parents and participate more actively as part of their support system. It also gave me an opportunity to develop new areas of expertise and leadership responsibilities.

Why did you choose to work at Northwestern?
While I truly enjoyed the experiences gained with a large healthcare system, I had a strong desire to return to a rich academic environment. Although other opportunities came along, Northwestern University held the strongest appeal. In addition to enjoying a reputation as one of the best, the vibrancy of Northwestern is felt almost immediately upon arrival to both the Evanston and Chicago campuses. The passion exhibited by individuals I met during my on-campus interview sessions was outstanding. Since my arrival, I continue to be impressed with the caliber of professionalism and collegiality demonstrated by the faculty and staff.

How do you help scientists and/or research students at the medical school?
When I think of the medical school specifically, I see our future. Feinberg is one of the top medical schools in the nation and the depth and breadth of the research, education and clinical opportunities are quite impressive. It is my responsibility to promote, facilitate and enhance the research by supporting and navigating our scientists and student researchers through, what can often be, a complex regulatory environment.

Researchers are naturally inquisitive and often want to know more than the "how" to get something through the Institutional Review Board (IRB), they want to understand the "why" is it done this way. This is where the IRB Office often plays a critical supportive role.

What is your favorite part of the job?
My favorite part of being part of the Northwestern community, is having the opportunity to be a "servant leader" at an incredible university.

What exciting projects are you working on?
The IRB leadership team, along with Ann Adams, associate vice president of research has done a tremendous job in preparing and submitting Northwestern's initial accreditation packet to the Association for Accreditation of Human Research Protection Programs (AAHRP). This will be an incredible achievement for Northwestern and requires a strong commitment from the entire university. Another major focus will be on strengthening and creating strong relationships with our community partners to facilitate creative and innovative processes for reducing redundancy and streamlining processes for our busy scientists

What do you like to do in your spare time?
Life is about new experiences and creating memories. I am always up for spending time with family and friends taking a cooking class, exploring a museum and visiting a park or zoo. I also enjoy visiting historical places and antique markets.

Anything else you would like to share?
I am thrilled to be a part of the Northwestern University and look forward to working with the research community.

Using Nanomaterials to Create Cancer Therapies

Tim Sita, Medical Scientist Training Program

Tim Sita, a sixth-year MD/PhD student in the Northwestern University Medical Scientist Training Program, studies of the application of nanomaterials to cancer therapy in the laboratories of Alexander Stegh, PhD, assistant professor of Neurology, and Chad Mirkin, PhD, George B. Rathmann professor of Chemistry and professor of Medicine.

Sita earned a Bachelor of Science degree in chemical and biological engineering and molecular biology from the University of Wisconsin Madison. Since the age of six, Sita knew he wanted to research and develop therapeutics for cancer. This passion led him to pursue a PhD in research training to achieve his goals.

Q&A

Where is your hometown?
My hometown is Kildeer, Illinois, which is about an hour northwest of downtown Chicago.

What are your research interests?
My research interest is in the application of nanomaterials to cancer therapy. Specifically, I am interested in improving treatment of glioblastoma multiforme (GBM, brain tumors) with nanotherapeutics designed to silence critical GBM oncogenes driving proliferation and chemotherapeutic resistance.

What exciting projects are you working on?
I am currently developing spherical nucleic acids (SNAs) for the treatment of GBM. These novel constructs consist of 13-nanometer gold nanoparticles that are coated with small interfering RNA (siRNA) molecules capable of performing gene knockdown. These nanoparticles have been shown to cross the blood-brain barrier and preferentially accumulate in brain tumors due to their small size. I have also generated mouse models that allow for non-invasive imaging of protein expression in GBM. Specifically, I have engineered them to allow for tracking of a chemoresistance gene that my SNAs are targeting and attempting to silence. When these mice are treated with SNAs, I am able to visualize silencing of the chemoresistance gene in their brain tumors in real-time, indicating the mouse is ready for treatment with chemotherapy.

What attracted you to the MD/PhD program?
I have always wanted to design cancer therapeutics, dating back to age six when I tried to make a cure out of toothpaste, Rice Krispies and olive oil. However, when I had the opportunity to volunteer at a hospital in college, I discovered that I wanted to care for cancer patients in addition to research novel therapeutics.

The MD/PhD program trains you for both of those careers, so it was a perfect fit for me. Once I decided to pursue an MD/PhD program, Northwestern became the clear front-runner for me due to its world-class reputation for excellence in nanotechnology and cancer research and beautiful downtown Chicago location.

What has been your best experience at Feinberg?
I would have to say meeting my wife in the first week of medical school. We both had last names that began with the letter 'S' and were often paired together in small group activities. Our lives were entirely changed by alphabetization, as we got married three years later and now have two kids!

How would you describe the faculty at Feinberg?
In addition to being brilliant, the faculty members are truly dedicated to student development and passionate about teaching. I have had the unique opportunity to see this on both the Chicago and Evanston campuses, as I have taken courses on both campuses and I am training under outstanding mentors at both locations.

There are always stimulating discussions about next research steps and about what is currently known in the literature. I constantly feel challenged to learn more and to expand our knowledge base through experiments.

What do you do in your free time?
I enjoy spending time with my family, biking, kayaking, brewing beer, grilling and exploring all of the restaurants Chicago has to offer.

What are your plans for after graduation?
Following graduation, I hope to enroll in a residency program in radiation oncology. In this exciting field, I will be able to design treatment plans for cancer patients while continuing to pursue my research interest in applying nanomaterials to cancer therapy.

Research in the News

***The New York Times,* Feb. 2**

Study Finds Growing Reason to Be Wary of Some Reflux Drugs
Todd Semla was quoted.

***Associated Press,* Feb. 3**

Rookie docs can work longer flex hours safely, study finds
Karl Bilimoria was quoted.

► This research was also featured in *The New York Times*, *Reuters*, *The Washington Post*, *NPR* and more.

***The Wall Street Journal,* Feb. 9**

Stress Raises Cholesterol More Than You Think
Neil Stone was quoted.

***The New York Times,* Feb. 10**

Study in Brazil Links Zika Virus to Eye Damage in Babies
Lee Jampol was quoted.

► This research was also featured in *The Associated Press*, *USA Today*, *The Washington Post*, *US News & World Report, WebMD* and more.

***HealthDay News,* Feb. 16**

You Can Predict Which Male Teens Will Live With Their Future Kids
Craig Garfield was quoted.

***CBS News,* Feb. 24**

The biggest distractions that cause car crashes
Karen Sheehan was quoted.

***Reuters,* Feb. 25**

Colorado visitors end up in ERs more for pot use than residents
Howard Kim was quoted.

► This research was also featured in *Fox News, CNN, NPR, Chicago Tribune, LA Times, Yahoo! News* and more.

***PBS* (Local), Feb. 25**

Cancer Experts Talk Transformation in Treatment and Care
Francis Giles was quoted.

More media coverage available online.

Northwestern University
NUCATS
Clinical and Translational Sciences Institute

NUCATS Corner

Sign Up For the EQuaTR Conference

The NUCATS Institute, in collaboration with the Association for Clinical Research Professionals (ACRP), will be hosting the Enhancing Quality in the Translational Research Workforce (EQuaTR) Conference, Wednesday, May 11, at Northwestern Memorial Hospital, Feinberg Pavilion, 3rd Floor.

The EQuaTR conference is designed for those who would like to gain additional knowledge on current trends and issues in clinical research.

This conference is open to all professionals in clinical and translational research including investigators, clinical research coordinators, monitors, project and site managers, regulatory staff, research assistants, allied health professionals and others from both academia and industry.

The conference will host two outstanding speakers:

► Rebecca Williams, PharmD, MPH, assistant director, ClinicalTrials.gov at the National Library of Medicine at the National Institutes of Health

► Manu Vora, PhD, MBA, ASQ, CQE, chairman and president of Business Excellence, Inc., USA and adjunct faculty in the School of Professional Studies at Northwestern

Breakout session topics include:

- All About Stakeholders: Working with Community Teams in the Research Environment
- Leading Research Teams that Collect High Quality Data
- Leveraging Digital and Social Channels for Superior Targeting and Efficiencies in Patient Recruitment

Registration deadline is April 27.

Read more about the conference, registration and browse the full agenda. Contact NUCATS with any questions at nucats-ed@northwestern.edu or 312-503-7952.

Sponsored Research

PI: Jaehyuk Choi, MD, PhD
Ruth K. Freinkel assistant professor of Dermatology, Biochemistry and Molecular Genetics

Sponsor: National Cancer Institute

Title: "The Role of ZEB1 Mutations in Cutaneous T Cell Lymphoma"

Cutaneous T-cell lymphoma (CTCL) is an incurable non-Hodgkin lymphoma of the skin-homing CD4+ T cell. The transcription factor ZEB1 is a critical tumor suppressor in this disease as it is subject to loss-of-function mutations in 65 percent of CTCLs.

Dr. Choi's team recently published a comprehensive list of the driver genes in this disease using a combination of whole exome, whole genome and RNA-sequencing. This analysis identified mutations that occurred more often than expected by chance and pinpointed the gene mutations that underlie CTCL pathogenesis.

The award seeks to investigate disease mechanisms by exploring the function of a tumor suppressor that his team has identified to be important in this disease, ZEB1.

They will use relevant human and mouse models to identify ZEB1's functions in normal and malignant T cells. Through these efforts, they hope to elucidate disease pathogenesis and develop novel therapeutics.

PI: Karen Ho, MD
assistant professor of Surgery in the Division of Vascular Surgery

Sponsor: National Heart, Lung, and Blood Institute

Title: "The Role of Gut Microbiota in Neointimal Hyperplasia After Vascular Injury"

Blockages in blood vessels caused by advanced atherosclerosis frequently lead to heart attacks, strokes, foot ulcers, gangrene and limb loss and can be treated by balloon angioplasty/ stenting and bypass surgery. However, the rate of treatment failure due to "restenosis," or recurrent narrowing of arteries due to excessive thickening and scarring of the vessel wall, can reach 50 percent in five years.

In this research program, Dr. Ho's team will investigate the mechanisms by which short chain fatty acids (SCFA) and other gut microbe-derived metabolites regulate the healing response of blood vessels and whether strategies for changing the composition and activity of gut microbes can reduce the risk of restenosis after cardiovascular interventions.

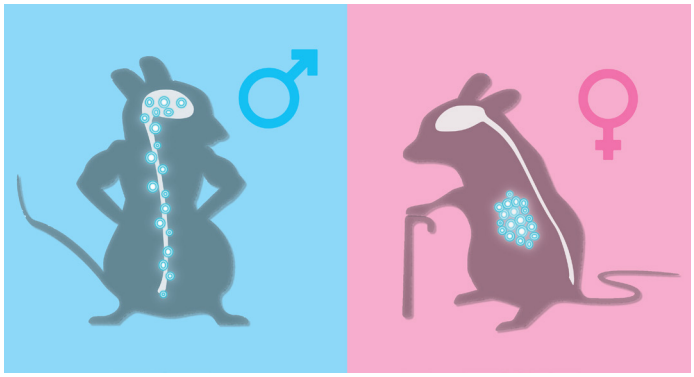
The aims of this proposal are to evaluate the functional role of the gut microbiome in a murine model of neointimal hyperplasia, to determine if microbiome-derived SCFA regulate neointimal hyperplasia through modulation of systemic and/or local inflammation. The final aim is to determine if microbiome-derived SCFA regulate neointimal hyperplasia through direct modulation of cellular proliferation, migration and/or apoptosis.

Welcome New Faculty

Daniela Matei, MD, joins as professor of Medicine in the Division of Hematology/Oncology and a professor of Obstetrics and Gynecology in the Division of Gynecologic Oncology. She will play a key role within the Lurie Cancer Center as co-leader of the Women's Cancer Research Program.

Dr. Matei joins Northwestern from the Indiana University School of Medicine, where she was a professor in the Departments of Medicine and Obstetrics and Gynecology and co-leader of Melvin and Bren Simon Cancer Center's Experimental and Developmental Therapeutics Program, coordinating drug development efforts at the bench and in the clinic. Her current research focuses on finding new treatments to eradicate ovarian cancer stem cells and improve outcomes. Another area of investigation is to target the epigenome and re-establish response to chemotherapy for ovarian tumors that have become resistant to treatment. Matei is actively engaged in clinical research and is involved in numerous clinical trials that test novel therapies for ovarian cancer, including several cooperative group and National Cancer Institute-sponsored trials for gynecologic cancers.

NPR's Accidental Brilliance in Science



Protective innate immune cells are present in both males and females, but they fail to protect in females. Only in males are these cells able to move to the brain and spinal cord where they block inflammation and prevent damage to the nervous system.

A Northwestern Medicine study, published last year in *The Journal of Immunology*, caught the attention of reporters from NPR's Science Desk after it was nominated for an award that celebrates "happy accidents" that help advance science.

The study was the result of an innocent mistake made by a graduate student in a the lab of Melissa Brown, PhD, professor of Microbiology-Immunology. The student accidentally used male mice instead of female mice during an experiment. The mistake led to a novel discovery that offers new insight into why women are more likely than men to develop autoimmune diseases such as multiple sclerosis.

"Women are three to four times more likely than men to develop MS, and much of the current research focuses on the question, 'Why do females get worse disease?'" said Brown.

"Now, thanks to a serendipitous moment in the laboratory, we are approaching this research from the opposite way, asking, 'Why are males protected from disease?' Understanding the mechanisms that limit disease in men can provide information that could be used in future therapy to block disease progression in women."

Because of the "happy accident" nature of the study, Northwestern University media relations staff nominated Brown for the NPR "Golden Mole Award for Accidental Brilliance." The award celebrates accidents, mistakes and coincidences that have led to scientific discoveries and insights.

Brown was interviewed by NPR reporter Adam Cole and was featured in NPR broadcast and print stories. While she didn't win the award, her story was selected as a top 12 finalist.

Read more about Brown's study and the other finalists on NPR and watch a video about this unique award and how it got its name.

Funding

Interest to Highlight High-Priority Zika virus (ZIKV) Research Areas

More information

Sponsors: Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institute of Neurological Disorders and Stroke, National Institute of Dental and Craniofacial Research, National Institute of Allergy and Infectious Diseases

Submission deadline: Ongoing

Synopsis: The NICHD, NINDS, NIDCR and NIAID are issuing a notice to highlight interest in research on Zika virus as it relates to the mother-infant dyad and sequelae of infection.

Pathway to Stop Diabetes - Visionary Award

More information

Sponsor: American Diabetes Association

Submission deadline: July 1

Upper Amount: $1.6M

Synopsis: The Pathway to Stop Diabetes Research Program intends to attract brilliant scientists at the peak of their creativity to diabetes research, and to accelerate their research progress by providing the necessary resources and support for conducting transformative science. This program will consider applications directed toward all topics relevant to prevention, treatment and cure of all types of diabetes (type 1, type 2 and gestational diabetes), diabetes-related disease states (obesity, pre-diabetes and other insulin resistant states) and the complications of diabetes.

Exploratory Clinical Trials of Novel Interventions for Mental Disorders

More information

Sponsor: National Institute of Mental Health

Submission deadline: July 27

Upper Amount: $4M

Synopsis: The purpose of this Funding Opportunity Announcement (FOA) is to support the efficient pilot testing of novel interventions for mental disorders in adults and children through an experimental therapeutics approach. Under this FOA, trials must be designed so that results, whether positive or negative, will provide information of high scientific utility and will support "go/no-go" decisions about further development or testing of the intervention.

View more funding opportunities

Galter Library Connection

FAQs About NIH Public Access Compliance and PMCIDs

Galter Library has compiled frequently asked questions and answers related to PubMed reference numbers (PMCID) and compliance with the NIH Public Access Policy. These Q&As can help scientists and staff who are unsure how to become compliant with the policy.

Q: Who is responsible for making sure a paper gets a PMCID number?

A: Ultimately, it is the responsibility of the principal investigator of the grant to make sure that all publications linked to the grant are compliant with the NIH policy and are assigned a PMCID.

Q: Doesn't every paper get a PMCID? Is that different from a PMID?

A: Many people are still not sure where PMCIDs come from. Every paper does not get a PMCID automatically, even if it is associated with a grant. PMID is the PubMed ID. Every paper that is listed in the PubMed database is given a PMID. This is simply an identification number for the citation in PubMed PMCID is the PubMed Central ID. This identifier is given to a paper when its full text version is deposited to PubMed Central (PMC) the NIH's database of full text manuscripts.

Q: But I acknowledged my grant in the acknowledgements section of my paper. Shouldn't this mean that it will be added automatically to PubMed Central by my publisher?

A: No. Publishers are not required to add your papers to PMC. Publishers will not take the information from the acknowledgements and automatically deposit the manuscript for you. Some journals do deposit all of their content automatically to PMC, regardless of funding. If you publish in one of these journals (called "PMC journals"), your manuscript will be deposited and will receive a PMCID automatically. Most journals do not deposit to PMC, so you will need to take responsibility for having the manuscript deposited to PMC through the NIH Manuscript Submission system (NIHMS).

Some other publishers will start this process for you by depositing the manuscript to NIHMS, but they will only do this if you tell them at the time you sign the author agreement for publication. You must tell them of your NIH funding and provide them with the appropriate grant numbers on your author agreement letter. If you do not supply this information at the time of manuscript submission, most publishers will NOT deposit the manuscript to NIHMS for you.

Q: I just checked, and my journal does not deposit to PMC directly. How do I deposit to NIHMS?

A: Make sure you have a copy of the "post-print" of the manuscript. The post-print is your final draft of the accepted, peer-reviewed manuscript with all of the changes and edits made, but before the journal's formatting is applied.

Q: But I can't find this version of the manuscript! Can't I just deposit the publisher's PDF to NIHMS?

A: The NIH recommends against depositing the journal's copyrighted version of the manuscript to NIHMS. You need to check the journal's copyright and author permissions to see which version you can deposit to NIHMS or another repository. Alternately, you can check the SHERPA-RoMEO database for your journal's policies regarding archiving. When you have the manuscript ready, you (or someone acting on your behalf) can log into the NIHMS system to deposit the manuscript. For details on navigating NIHMS and what actions you must take after depositing there, please refer to the NIHMS help documentation at the NIH.

Q: I have a progress report due and some of my manuscripts are not compliant (don't have PMCID numbers). Can I just leave them out of the RPPR?

A: If your grant funded the work in the paper, you should not omit papers from your progress report just because they are non-compliant. However, if you include non-compliant publications on an NIH progress report (RPPR), the NIH will withhold funds for the coming year until the compliance issues are addressed. For this reason, we recommend that you address compliance of each and every publication that arises from your grant at the time it is accepted for publication. This will give you time to bring your manuscripts into compliance before your progress report is due.

Q: I feel this is too complicated and overwhelming. How can I manage all of this?

A: Deal with compliance early. Make it part of your normal work flow. Make sure you get and keep a copy of the post-review final draft of every paper linked to your grant(s). Consider depositing this post-print in Galter Library's DigitalHub repository. That way we have a copy we can use in assisting you with deposit to NIHMS. Make sure that all of your trainees and co-authors know about the policy's requirements and their own responsibilities.

Available resources:

The NIH Public Access Policy website

Galter Library's NIH Public Access Policy guide

The NIH Public Access Compliance Reporter at Galter Library

High Impact Factor Research

January 2016

Gidding SS, Rana JS, Prendergast C, McGill H, Carr JJ, **Liu K, Colangelo LA**, Loria CM, Lima J, Terry JG, Reis JP, McMahan CA. Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Risk Score in Young Adults Predicts Coronary Artery and Abdominal Aorta Calcium in Middle Age The CARDIA Study. *Circulation*. 2016 Jan;133(2):139-146.

Luo ZJ, Lin CQ, **Woodfin AR, Bartom ET**, Gao X, Smith ER, **Shilatifard A**. Regulation of the imprinted Dlk1-Dio3 locus by allele-specific enhancer activity. *Genes & Development*. 2016 Jan;30(1):92-101.

Martinez-Reyes I, Diebold LP, Kong H, Schieber M, Huang H, Hensley CT, **Mehta MM,** Wang T, Santos JH, Woychik R, Dufour E, Spelbrink JN,**Weinberg SE**, Zhao Y, DeBerardinis RJ, **Chandel NS**. TCA Cycle and Mitochondrial Membrane Potential Are Necessary for Diverse Biological Functions. *Molecular Cell*. 2016 Jan 21;61(2):199-209.

McCrea PD, **Gottardi C**J. Beyond beta-catenin: prospects for a larger catenin network in the nucleus. *Nature Reviews: Molecular Cell Biology*. 2016 Jan;17(1):55-64.

Nagpal V, Rai R, Place AT, Murphy SB, Verma SK, Ghosh AK, Vaughan DE. MiR-125b Is Critical for Fibroblast-to-Myofibroblast Transition and Cardiac Fibrosis. *Circulation.* 2016 Jan 19;133(3):291-301.

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Nemmers Prize in Medical Science Announced

Huda Zoghbi, MD, a Howard Hughes Medical Institute investigator and professor at Baylor College of Medicine known for her groundbreaking research on Rett syndrome and other neurological disorders, is the inaugural recipient of the Mechthild Esser Nemmers Prize in Medical Science at Northwestern University.

The Nemmers prize, which carries a $200,000 stipend, is awarded to a physician-scientist whose body of research exhibits outstanding achievement in their discipline as demonstrated by works of lasting significance. A jury of distinguished scientists from around the country made the final selection.

"Huda is a superb physician-scientist who has transformed the way we think about the genetic determinants and mechanisms of diseases," said Eric G. Neilson, MD, vice president for medical affairs and Lewis Landsberg Dean at Northwestern University Feinberg School of Medicine. "We are privileged to honor her with this inaugural award and for her to share her work with us."

In connection with this award, Dr. Zoghbi will deliver a public lecture and participate in other scholarly activities at Feinberg in the coming year.

"It is a tremendous honor to be the inaugural Nemmers Prize recipient in Medical Science, and to have the opportunity to share my research with the stellar community of Northwestern University," Dr. Zoghbi said. Read more about Zoghbi and the award.

Calendar

Tuesday, March 22

Immunology Taught By Humans

Mark Davis, PhD, professor, Stanford University School of Medicine, will present.

Time: Noon to 1:00 p.m.
Location: Robert H Lurie Medical Research Center
Baldwin Auditorium
303 E. Superior
Contact: m-brown12@northwestern.edu
More information

Thursday, March 24

New Insights into Food and Built Environment Inequities and their Cardiovascular Health Implications

Shannon Zenk, PhD, associate professor, University of Illinois at Chicago, College of Nursing, to present.

Time: Noon to 1:30 p.m.
Location: Robert H Lurie Medical Research Center
Baldwin Auditorium
303 E. Superior
Contact: fame@northwestern.edu
More information

Thursday, March 31

Translational Bridge Mini-Symposium-Targeting the DNA Damage Response in AML through NAE and HDAC Inhibiton

Steven Grant, MD, professor, Virginia Commonwealth University-Massey Cancer Center to present.

Time: Noon to 1 p.m.
Location: Robert H Lurie Medical Research Center
Searle Conference Room
303 E. Superior
Contact: cancer@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

Precision Medicine Initiative to Launch
The Precision Medicine Initiative (PMI) is a bold new research effort announced by President Obama to revolutionize how we improve health and treat disease. The PMI aims to leverage advances in genomics, emerging methods for managing and analyzing large data sets while protecting privacy and health information technology to accelerate biomedical discoveries.

NIH is driving major components of PMI, including the PMI Cohort Program, a landmark longitudinal research study of one million or more U.S. volunteers to expand our understanding of ways we can improve health and treat disease. The NIH's goal is to enroll 79,000 cohort participants by the end of 2016. Read more about the NIH's role in launching this initiative.

Sex as a Biological Variable
NIH grant applications due on or after January 25, 2016, will be evaluated on how they account for sex as a biological variable (SABV) in studies with vertebrate animals and humans. The new policy (NOT-OD-15-102), instructs scientists to account for the possible role of sex as a biological variable in animal and clinical studies and to factor sex into research designs, analyses and reporting.

Teresa Woodruff, PhD, the director of the Women's Health Research Institute at Northwestern Medicine, was a driving force behind the new NIH policy to include women – from cells to animals – in preclinical research. Woodruff and the Institute's leadership council have been actively advocating for sex inclusion in all levels of research to NIH and Congress for several years including a pivotal article in the journal *Nature* in 2010.

"I think this will go down in history as one of the most important changes that will occur in biomedical science at least for the next decade," said Woodruff. "The intellectual argument that the biology of sex informs health and therefore matters in all stages of biomedical research is now there."

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