

FSM Research Newsletter

September 2008

Feinberg School of Medicine Office for Research
Northwestern University

MCRC FUNDING SUPPORTS PATIENT-ORIENTED RESEARCH STUDIES MAY LEAD TO BETTER STRATEGIES FOR PREVENTION AND TREATMENT

The Multidisciplinary Clinical Research Center in Rheumatology (MCRC) has just entered the second year of a five-year, \$5.9 million award from the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS).



Richard Pope, MD

The award reflects a strong focus on clinical, patient-oriented research that has flourished under the direction of Richard Pope, MD, the Mabel Green Meyers

Professor of Medicine

-Rheumatology and chief of the Division of Rheumatology. For example, the MCRC, formerly known as the Multipurpose Arthritis and Musculoskeletal Disease Center (MAMDC), has grown from having five

funded clinical researchers in 1989 to its current number of more than 25. Similarly the funding for patient-oriented research generated by the Feinberg faculty in the Division of Rheumatology has almost doubled, from \$2.5 to \$4.8 million per year between 2001 and 2006.

The current NIAMSD funding supports four MCRC projects, which are all now beginning their second year:

Project 1, led by Leena Sharma, MD, professor of medicine, is exploring the potential beneficial role of hip muscle strength in knee osteoarthritis (OA).

Specifically this clinical epidemiologic project is looking at the effect hip muscle strength, especially hip abductor and external rotator

strength, has on knee OA disease progression, decline in physical function, and progression of disability. Further understanding of the relationship between hip muscles and knees may eventually lead to improved strategies for preventing disability due to knee OA.

Project 2, under the direction of principal investigator Rosalind Ramsey-Goldman, MD, DrPH, professor of medicine, is a clinical epidemiologic study examining the relationship between

cardiovascular and bone outcomes and gene expression in patients with systemic lupus erythematosus (SLE). Using a well-characterized cohort, Dr. Ramsey-Goldman is

isolating monocytes and macrophages, with the goal of identifying a gene marker for cardiovascular disease and osteoporosis. If it

is possible to correlate gene expression patterns with clinical parameters, including patient outcomes, physicians might be better able to predict risk in individual patients with SLE as well as identify potential therapeutic targets.

Project 3 is a health-services research study that is an ancillary study to an ongoing randomized clinical trial assessing the utility of physical activity management (PAM) intervention in

reducing disability progression in patients with rheumatoid arthritis (RA) and knee OA.

The health utility study is led by principal investigator Dorothy Dunlop, PhD,

research associate professor. The objective of this study is to determine if PAM prevents disability progression and is thereby cost-effective. The results of this study may affect public policy strategies with regard to the widespread use of PAM intervention for the purposes of reducing disability and lowering health care costs.

Project 4 is a developmental project that is in the second year of three-year funding. This project is looking at the role of specific genetic variants in patients with scleroderma. In the first year of the study, investigators have collected DNA from approximately 100 well-characterized patients and controls. Initial analysis has resulted in some interesting preliminary findings, including a few single nucleotide polymorphisms (SNPs).

"Our funding from the NIAMS reflects their current focus and ours," says Dr. Pope. "As clearly demonstrated by the four projects currently funded, our work is patient-oriented, with objectives that can lead to better understanding of disease, prevention strategies, effective treatment options, and improved quality of life."



Dorothy Dunlop, PhD



Leena Sharma, MD



Rosalind Ramsey-Goldman, MD, DrPH

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MEET THOMAS HOPE, PHD



Professor of Cell and Molecular Biology

What are your research interests and projects currently under way?

My research focuses on HIV. One aspect of this work involves looking at how the virus interacts with cells. We set up a viral life cycle, and then look at the virus in time-lapse and sync that with how the virus interacts with the host cell. We are interested in looking at how it transfers and moves within cells as it infects them.

Another aspect of my research focuses on sexual transmission of the virus. Specifically, we are looking at how HIV crosses the epithelial barrier. As part of this research, we use samples of human tissue obtained during surgical procedures. This is our first level of observation. When we observe something interesting in this model, we then apply the study to a rhesus macaque monkey. This is an excellent animal model to use in HIV studies because Simian immunodeficiency is similar to HIV.

Our goal is to find out how the HIV virus crosses the epithelial layer; then we can apply this research into developing a vaccine to prevent this from happening.

We have learned much about HIV in the past few decades. We have developed effective medications to help control the disease, but these are expensive and difficult to provide to the parts of the world where needed most—especially third world nations. Our efforts now must be to find a vaccine to prevent the occurrence of HIV. I am proud to be a member of the Center for HIV-AIDS Vaccine Immunology (CHAVI), a consortium of about 300 researchers at universities and academic medical centers around the world. CHAVI was established by the National Institute of Allergy and Infectious Diseases (NIAID) with the goal of solving major problems in HIV vaccine development and design.

What brought you to the Feinberg School?

I came to Feinberg about three years ago because I welcomed the

opportunity to work with such an esteemed group of scientists. In particular, the Cell and Molecular Biology here is outstanding and offers researchers such as myself incredible resources and technology to support our work.

What challenges do you face?

We must continue to keep HIV research as a priority. We have learned a lot, but there is so much more to do. I am lucky to have my work supported by NIH as well as by the Elizabeth Glaser Pediatric AIDS Foundation. Funding is critical, so we must keep this important work in the hearts and minds of the public.

WELCOME NEW FACULTY

Shannon Haymond, PhD joins as assistant professor of pathology. He received his PhD from Michigan State University and obtained his postdoctoral research training at Washington University.

Wellington Hsu, MD joins as assistant professor of orthopedic surgery. After receiving his MD from Vanderbilt University, he obtained his postdoctoral research training at the University of California, Los Angeles and University of Wisconsin, Madison.

Peter Hulick, MD joins as assistant professor of medicine. He received his MD from Thomas Jefferson University. His graduate medical training was completed at St. Luke's Hospital - Mayo Clinic in Florida and Harvard Medical School and his postdoctoral research training was done at the Massachusetts General Hospital Cancer Center.

Muriel Jean-Jacques, MD joins as assistant professor of medicine in the Division of General Internal Medicine. She obtained her MD from Johns Hopkins University, her graduate medical education

from Massachusetts General Hospital, and her postdoctoral research training from the University of Chicago.

Jessica Kiley, MD joins as assistant professor of obstetrics and gynecology. She received her MD from University of Florida, College of Medicine and pursued professional training at University of Chicago Hospitals and Northwestern Memorial Hospital.

Shuo Ma, MD, PhD joins as assistant professor of medicine. She obtained her MD from Beijing Medical University and her PhD from Northwestern University.

Halla Nimeiri, MBBS joins as assistant professor of medicine. She received her MBBS from University of Khartoum in Sudan and obtained her graduate medical training at both Mercy Catholic Medical Center at Drexel University and University of Chicago Medical Center.

C. Shad Thaxton, MD, PhD joins as assistant professor of urology. He obtained both his MD and PhD degrees from Northwestern University.

IN THE NEWS

U.S. hospitals flunk colon cancer exam

Los Angeles Times – September 9th

http://latimesblogs.latimes.com/booster_shots/2008/09/us-hospitals-fl.html

More than 60% of U.S. hospitals failed to comply with the recommendation to get pathology results on at least 12 lymph nodes.

"It's disappointing that despite so much emphasis on this particular issue, so many hospitals still aren't checking enough lymph nodes to ensure they diagnose the accurate stage of cancer," said Dr. Karl Bilimoria, surgery resident and lead author said in a news release. "Knowing the accurate stage of your disease affects your survival and treatment. That's critical."

SPONSORED AWARDS



Julius P. A. Dewald, PhD
Associate professor and chair, Department of
Physical Therapy & Human Movement Sciences

Project Title:

The Loss of Independent Joint Control of the Upper Limb in Spastic Hemiparetic CP

Sponsor: National Institute of Neurological Disorders and Stroke

Movement discoordination in individuals with spastic hemiparetic cerebral palsy (SH-CP) may be caused by stereotypic multi-joint movement patterns (synergies), reflecting a loss of independent joint control. Using virtual mechanical environments generated by a 3D robot, we plan to quantify the presence and extent to which this discoordination exists. Finally we propose to quantify differences in morphology between brain hemispheres and fiber density in these individuals versus control subjects and its relationship with the expected loss of independent joint control.

[Click here for a list of recent FSM sponsored awards](#)



Craig Weiss, PhD
Research associate professor, Department of
Physiology

Project Title: The Role of Prefrontal Cortex and Thalamus During Trace Eyeblink Conditioning
Sponsor: National Institute of Neurological Disorders and Stroke

The goal of this research is to define the interactions between the prefrontal cortex and interconnected thalamic nuclei in mediating acquisition and consolidation of trace eyeblink conditioning, a well-studied paradigm for associative learning and memory in mammals. Reversible inactivation of the prefrontal cortex will be used to define sites required for expressing conditioned responses. Connections of these sites with the thalamus will be identified by neuroanatomical tracing. The relative activities of these interconnected sites will be determined by recording behavioral responses and responses of multiple single neurons from each site in vivo. The experiments should lead to a better understanding of the role of the forebrain in associative learning, age-related learning and memory impairments, and the neural mechanisms mediating addiction.

MEET DEEPAK P. SRIVASTAVA, PHD



Research Associate
Physiology – Penzes Lab

Where are you from? I was born and brought up in the UK. I spent most of my time in either Northern Ireland or in Exeter in the southwest of England.

Before coming to Chicago in 2005, I lived in Cardiff (Wales) and Cambridge (England).

What are your research interests? My research interests lie in the signaling pathways that are involved in the bidirectional control of synaptic plasticity (the strengthening and weakening of communication between neurons) and how neuromodulators influence excitatory synapses in the cortex via these pathways. Recent studies have shown that altering the morphology of tiny structures on neurons, called dendritic spines, can have profound effects on the communications between neurons. How neuromodulators, specifically neurosteroids such as estrogen, affect synaptic communications, and the cellular and molecular underpinnings that govern these actions are of great interest to me. Uncovering these mechanisms will not only enhance our understanding of normal brain functions, but will also help to reveal the role that modulators play in neuropathologies and neuropsychiatric disorders. Our lab website is:

<http://www.medschool.northwestern.edu/penzes/index.html>

What attracted you to Northwestern University

Interdepartmental Neuroscience (NUIN)? The neuroscience research performed in the various departments affiliated with NUIN and at the Feinberg School had a big influence in attracting me here. In addition, the chance to work with a young and enthusiastic principal investigator (Peter Penzes) in a world-renowned research environment also played a huge role in my choice to come to NUIN.

Also I was told by a lot of people how great Chicago was to live in, and that it has a quality night life (which, following thorough investigation, I have to agree with).

What is the best part about being a postdoc? You finally get paid a little bit more! One of the best things about being a postdoc is being given the opportunity to develop your own research ideas, getting involved and interacting more closely with collaborators, and overseeing and running projects. Additionally you get the chance to get more involved in the day to day running of a lab and also get to help mentor graduate students (or minions as we like to call them!).

How would you describe the faculty members at the Feinberg School? The faculty members here are great. They are very friendly and helpful and are willing to offer advice and guidance to others outside of their labs. They are also generous with their expertise and equipment as well as being keen and willing to set up collaborations between labs.

What are your interests outside of research? Currently I am really enjoying the music scene here in Chicago, such as going to see many of the bands and DJs that play at various venues in the city. I love watching football (or soccer as it is called here) and most martial arts, and I get involved whenever I can. Aside from that I regularly go to Holmes Place and generally get out and about to see what the city has to offer (and there is a lot).

What are your plans after finishing your postdoc? After finishing my postdoc with Peter Penzes, I hope to set up my own lab, possibly back in the UK and continue my research into the cellular and molecular mechanisms underlying the actions of neuromodulators in the brain and how their dysfunctions contribute to disorders of the brain.

THE DIAGNOSTICS AND THERAPEUTICS SCREENING CORE OR, WHY YOU SHOULDN'T BUY A PLATE READER

The Lurie Cancer Center has established a core facility that works with Northwestern researchers to design, validate, and execute diverse high throughput experiments. This article describes the new facility's capabilities.



Contemporary biomedical research is increasingly driven by experiments that involve analysis of hundreds to

thousands of samples. Novel therapeutic agents, for example, can be identified by screening libraries containing tens of thousands of compounds for chemicals that produce a desired effect. Genes that are functionally critical for a broad range of interesting processes can be identified through genome-scale RNAi experiments or analysis of large collections of mutant strains. Thousands of proteins can be expressed and characterized in parallel.

A cursory analysis of high-impact biomedical journals demonstrates the emerging power of such large-scale experimentation; this will certainly become more prominent in the future. Unfortunately, this kind of research is out of reach for scientists at most academic institutions. The instrumentation required is expensive and often difficult to use. More importantly, designing an assay that is well adapted for high throughput analysis requires specialized expertise. Bringing these methodologies into academic research has required establishment of collaborative core facilities.

To serve this need, the Robert H. Lurie Comprehensive Cancer Center of Northwestern University has established the Diagnostics and Therapeutics Screening Core as a new shared resource; it is further described at www.northwestern.edu/HTA. This facility serves as a high-throughput analysis laboratory, in which researchers can access diverse tools for large-scale approaches, as well as a hub for distribution of RNAi tools for disruption of gene function in mouse or human cells. The facility is directed by Dr. Chi-Hao Luan, who formerly ran a core facility for large scale expression and characterization of proteins at University of Alabama, Birmingham. It is located on the Evanston campus in an extensively remodeled laboratory module.

Analytical capabilities

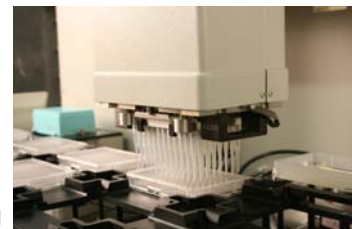
The screening core has a remarkable suite of instruments for gathering data from multi-well plates. If you are thinking about buying a plate reader, please consider using the instruments in the core instead! In addition to standard fluorescence and absorbance measurement, screening core plate readers can measure fluorescence polarization and time-resolved fluorescence, and can work with plates containing as many as 1536 wells per plate. Furthermore the core provides access to a Molecular Devices FLIPR TETRA plate reader, a unique instrument that integrates liquid handling with simultaneous and rapid data collection from an entire plate, permitting assays that rely on kinetic analysis (such as ion channel or G-protein coupled receptor studies).

In addition to photometric assays, the screening core can also perform high throughput microscopy using a new Cellomics ArrayScan system. This platform integrates automated fluorescence microscopy with sophisticated image analysis software, and includes an image database capability that allows quantitative evaluation of very large image datasets. The Cellomics system can, for example, measure relocalization of a cell surface marker to an intracellular compartment across thousands of different samples. This platform has proven effective in both industrial and academic settings.

Setting up experiments

The screening core has an outstanding system for high-throughput liquid handling that allows users to set up experiments in 96- and 384-well formats. Our main instruments are two Beckman BioMek FX liquid handling robots: one that performs operations 96 wells at a time, and another that has eight independent single-channel pipetting arms. The two instruments are linked by a robotic arm, allowing users to set up experiments in dozens of plates in which the content of each well is specified. This system is run by Beckman's latest software, and is robotically linked to an automated tissue culture incubator. The platform also includes an integrated BioTek ELX-405 plate washer, which is usable for 96- and 384-well plates, as well as a Tecan Ultra plate reader. Separately, the core has equipment that can accurately dispense nanoliter volumes into such plates. We also have equipment for traditional manipulation and growth of tissue culture cells on site.

Examples of experiments that are possible with this system include the application of compound libraries to tissue culture cells, setup of PCR reactions, 96-well plasmid minipreps, and ELISA assays. Essentially any experiment that one might perform using a pipetman at a lab bench should be possible in large scale with the screening core liquid handling platform.



Pipetting 96 wells at a time using a BioMek FX

RNAi @ NU: The Open Biosystems shRNA_{mir} collection

The emergence of RNAi as a tool for disrupting specified gene functions in metazoan cells is among the most exciting developments in contemporary molecular biology. This has occurred alongside an explosion in functional genomics pioneered in yeast, in which systematic disruption of every gene continues to yield new insight into fundamental biology. Considerable recent effort has focused on development of RNAi tools that allow similarly comprehensive disruption of gene function in mouse and human cells. While no one approach has proven 100 percent effective, several large collections of RNAi constructs now exist for this purpose. One of the best of these is the Open Biosystems lentiviral shRNA_{mir} collection, a vector system that takes advantage of an endogenous miRNA pathway to boost knockdown efficiency.

The screening core offers Northwestern researchers access to this Open Biosystems lentiviral shRNA_{mir} collection: this resource is described more fully at www.northwestern.edu/RNAi. As with any RNAi tool, the efficiency of mRNA knockdown will vary from construct to construct; in most cases, multiple knockdown constructs are available for each gene. Constructs are generally provided for a low fee to researchers as *E. coli* strains carrying the vector of interest, although the facility can prepare transfection-grade DNA if desired. We are particularly interested in promoting the use of this resource in large-scale analysis of gene function, combining the power of the instruments in the facility with the broad coverage available in the Open Biosystems shRNA_{mir} collection.

INSTITUTE PROVIDES RESEARCH GRANTS TO STUDY SEX DIFFERENCES

The Institute for Women's Health Research at Northwestern University's Feinberg School of Medicine provides seed grant funds, called Pioneer Awards, to spur the need to increase sex and gender based studies throughout the University. Teresa K. Woodruff, PhD, the Thomas J. Watkins professor of Obstetrics and Gynecology and executive director of the Institute, announced the recipients of its FY 2008 Pioneer Awards at a reception held in their honor on July 31. The recipients and their projects are:

Aaron Laposky, PhD. "Sleep and Women's Health: An animal model to investigate the role of sex and aging on sleep-wake regulation and chronic partial sleep loss"

Catherine Woolley, PhD. "Cryo-immuno Electron Microscopy to Study Estrogen-Sensitive Synaptic Vesicles"

Melissa Hogg, MD. "Women and the Vasculature: Sex differences in vascular injury"

Kimberly Scarsi, PharmD, MS, BCPS. "A Population-based Pharmacokinetic Model of Lopinavir/Ritonavir Concentrations in HIV-infected Women"

Jackie Gollan, PhD. "Women's Mental Health in Pregnancy and the Postpartum Period: Identifying neuroendocrine and behavioral predictors of postpartum depression"

"We were extremely impressed with the large number of applicants (n=60) this year and the quality of research that is being conducted at this institution," noted Woodruff. Two (Scarsi and Gollan) of the five grants were supported by a gift from the Friends of Prentice at Northwestern Memorial Hospital to the Institute. Each awardee received \$25,000.

STAFF PROFILE: DEBORAH EVERDS



*Research Administrator III
Department of Cell and Molecular Biology*

Where are you from? I grew up in the northern suburbs of Chicago and now live within walking distance of work.

What do you do at CMB? A variety of functions, for example; pre- and post-grant award administration; visas, graduate student administration, appointments, payroll, whatever else the chair (Dr. Goldman), and Donna Kellogg (the manager of operations), needs my assistance with.

How long have you been with FSM? On and off, close to twenty years.

What do you like about your job? The variety of tasks and interactions with persons in this institution, other institutions, the government, industry, etc., are interesting. I like working in an organization with such a diverse group of people, and enjoy working in my department in particular. As someone who previously worked in a more corporate environment, I enjoy working in the less formal environment of an educational institution. I feel a sense of satisfaction in playing a small part in promoting the teaching, research, and public health mission of FSM, and promoting the public interest mission of the University in general.

What's your education background? I finished my undergraduate degree at Northwestern University at the School of Continuing Studies. I have a law degree from John Marshall Law School. I just obtained a certificate in health law from DePaul.

What do you like to do in your free time? I have worked on pro bono matters for the Public Defender's Office, non-profit legal assistance foundations, as well as needy individuals. I consult with law firms on research regulatory and health care matters, since the research regulatory environment is complex, ever expanding and difficult to understand if you have not worked in it. I have also volunteered my time with other health care institutions on bioethics issues. I also visit family and friends, work out, read books, go to movies, shop, travel, etc. I have always been interested in art, and my minor in college was fine arts. I collect early to mid-twentieth century art, mainly prints, but some drawings and paintings.

ANIMAL RESEARCH CORNER

This year, the USDA inspector arrived on the 20th of August and spent three days at the University - visiting both the Chicago and Evanston campuses as well as the IACUC office. We are happy to announce that Northwestern received an excellent report without any non-compliant issues! Receiving this distinction is a huge accomplishment and in addition to the favorable preliminary indications from Association for the Assessment and Accreditation of Laboratory Animal Care International, it demonstrates how far the animal program at Northwestern has progressed in the last five years.

The United States Department of Agriculture (USDA) is responsible for ensuring that research facilities that use animals comply with the Animal Welfare Act (AWA). The Act was initiated in 1966 and several amendments have since been made. Currently, the Act, in relation to the species used at Northwestern, covers all warm blooded species except mice of the genus *Mus* and rats of the genus *Rattus* that are purpose-bred for research. For research facilities that utilize covered animal species, the AWA sets standards for the Institutional Animal Care and Use Committee (IACUC), animal facilities, veterinary care, identification and transport of animals, records, and the humane handling, care, and treatment of covered species. As part of the Act, the USDA conducts annual unannounced site visits to each institution that falls under the regulations set forth in the law.

We would like to thank the research community for helping the program grow and change and for their dedication to the humane care and use of animals at the University. We look forward to working with each and every one of you as Center for Comparative Medicine and the IACUC strive to make continual progress with the animal program.

Look for weekly event announcements and funding opportunities in your email.

UPCOMING EVENTS

Northwestern CNADC Alzheimer Seminar Series:

["Neuroimaging Biomarkers for Early Alzheimer's Disease"](#)

John G. Csernansky, MD, Lizzie Gilman Professor and Chair of
Psychiatry and Behavioral Sciences
303 E. Superior St., Lurie Building, Searle Seminar Room – CHI
Thursday, September 18th
Noon - 1 p.m.

For more information, call 312-908-9339

Sponsored by the Cognitive Neurology and Alzheimer's Disease
Center

12th Annual Frances Feinberg Memorial Lecture:

["Oxidative Enzymopathies and Cardiovascular Disease"](#)

Joseph Loscalzo, MD, PhD, Hersey Professor of the Theory and
Practice of Medicine, Chairman - Department of Medicine, Harvard
Medical School, Physician-in-Chief - Brigham and Women's Hospital
303 E. Superior St., Lurie Building, Hughes Auditorium – CHI
Friday, September 19th
4 - 6 p.m.

For more info, contact Donna Ray at 312-503-2296

Sponsored by Feinberg Cardiovascular Research Institute

Clinical Research Education Lecture Series:

[Clinical Trial Budgets](#)

Peri Todd, Director of Clinical Research, DuPage Medical Group
251 E. Huron St., Feinberg Pavilion, Conference Rooms B & C – CHI
Friday, September 19th
Noon - 1 p.m.

For more information, contact Maribeth Miceli at 312-695-0700

Sponsored by the NUgene Project

[The Salud Para Su Corazon Program](#)

[Community-Based Participatory Research Applied to Diabetes and
Cardiovascular Disease Prevention and Control in Hispanics](#)

Hector Balcazar, MS, PhD, Northwestern University Visiting
Professor in Diabetes

Regional Dean, El Paso Campus, Professor Division of Health
Promotion and Behavioral Sciences, The University of Texas School
of Public Health, Co-Director of the Hispanic Health Disparities
Research Center for the NIH

303 E. Superior St., Lurie Building, Hughes Auditorium – CHI
Wednesday September 24, 2008, 12:30 p.m.

For more info, contact Michelle Melin-Rogovin at 312-503-5050

Sponsored by NUCATS Community-Engaged Research Center

[Research Administration Training Seminar](#)

600 Foster Ave., Chambers Hall, Lower Level Classroom – EV
Four-session seminar: Sept 23rd, 25th, 30th and Oct 2nd

Registration is required. For more info or to reserve a seat, contact
nu-ori@northwestern.edu or 312-503-0054.

Sponsored by the Office of Research Integrity

Event organizers are encouraged to submit calendar items on
[Plan-it Purple](#). For more events, visit
www.feinberg.northwestern.edu/research/calendar/.

FUNDING OPPORTUNITIES

Whitehall Foundation Research Grants

<http://www.whitehall.org/grants/>

Letter of intent deadline: 10/1/08

Issuance of application materials: 12/15/08

Notable Eligibility Criteria:

- Research grants are available to established scientists of all ages working at accredited institutions in the United States.
- Grants-in-Aid program is designed for researchers at the assistant professor level who experience difficulty in competing for research funds because they have not yet become firmly established.
- Grants-in-Aid can also be made to senior scientists.

PhRMA Foundation Post Doctoral Program in Health Outcomes

<http://www.phrmafoundation.org/awards/outcomes/postdoc.php>

Online submission deadline: 10/1/08

Notable Eligibility Criteria:

- Well-trained graduates from PharmD, MD, and PhD programs who seek to further develop and refine their research skills through formal postdoctoral training.
- Must have a firm commitment from an accredited U.S. university and be a U.S. citizen or permanent resident.

Pew Scholars Program in the Biomedical Sciences (Limited Submission)

<http://pewscholars.com/pewscholar.html>

NU internal proposal due: 9/19/08

Online submission deadline: 11/1/08

Notable Eligibility Criteria:

- Open to individuals with a doctorate in medicine, other health related professions or biomedical sciences.
- As of November 1, 2008, candidates must hold full time appointments at the rank of assistant professor or equivalent on the faculty of the sponsoring institution.

Please contact Alden Chang at alden-chang@northwestern.edu or 847-467-0043 for more information. Submission instructions on internal applications can be found on the Office for Research Development's web page at:

<http://www.research.northwestern.edu/ord/limited-submissions/current-opportunities.html>

For more funding opportunities, visit:

www.feinberg.northwestern.edu/research/funding-opportunities/

We want to hear from you!

Your feedback and suggestions are always welcomed!

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