Understanding Disability and its Mechanisms

Engaging a vibrating platform to increase bone mass may seem unorthodox to the average person, but it’s all in a day’s work for rehabilitation researchers.

“Rehabilitation research finds ways to improve function for people with a variety of disabling conditions,” says Elliot Roth, MD, chair of the Department of Physical Medicine and Rehabilitation (PM&R). “That may involve exploring the mechanism, or the way that people develop disabilities, studying the types of disability or impairments they have, or applying what we learn to day-to-day function.”

PM&R researchers at Northwestern University Feinberg School of Medicine work with engineers, neuroscientists, rheumatologists, and basic scientists to understand the mechanism of movement and cognition. During the next year, Roth expects to see the department’s research expand and improve.

In collaboration with the Rehabilitation Institute of Chicago, Roth himself is currently working on two large projects: the Stroke Rehabilitation Research & Training Center, focused on getting stroke patients back to work and out in the community, and the Midwest Regional Traumatic Brain Injury Model System, which is developing novel interventions to improve ability after brain injury.

Roth says key investigators are working to push the department’s research forward.

“In our department, for example, investigators are working to better understand and improve functionality for amputees,” he says. “While others develop novel and innovative ways to improve bone density and reduce the loss of

Continued on pg. 2
bone in patients.”
Roth stresses that PM&R research is valuable because it ultimately reduces medical comorbidities, meaning complications of medical problems that happen in disabled patients such as falls, infections, and depression.

New Therapy for Bone Loss
Thomas Schnitzer, MD, PhD, professor in PM&R and medicine-rheumatology, is testing the effectiveness of vibration therapy along with hormone drugs to combat extensive bone loss in spinal cord injury patients. He says spinal cord injury patients have significant bone loss in their lower extremities and as a result have a higher incidence of fractures.

Now two years into the study, Schnitzer wants to understand the basics of why bone acts the way it does and, through better understanding, hopes to intervene in a way that will benefit people. The vibrating platform approach has already proven effective in animal studies.

“The more force you put across bone, the stronger it gets, the bigger it gets,” he says. “Spinal cord injury patients don’t have that load, so the question is, can you provide that some other way?”

While some patients in the study will receive vibration loading therapy, others will receive a naturally occurring anabolic hormone which stimulates bone growth. A third group will receive both hormone and vibration therapy.

“The thought is, if you work both of them together they are synergetic,” Schnitzer says. “If it works and bone mass increases in these patients, it will be a useful intervention to prevent the occurrence of fractures (in spinal cord injury).”

Improved Orthotics for Children

Stefania Fatone, PhD, assesses how orthoses design influences function in children.

PM&R Research continued from pg. 1

With the second study, Fatone is interested in how the child adapts to an ankle foot orthosis over a period of time.

“Clinical information suggests a lot of adaptation happens in the first four months of wearing this device,” she said. “We think they reach a point where the device is having its intended effect.”

The goal is to describe, quantify, and document the adaptation from a biomechanical perspective. Next steps include asking why the adaptation occurs and how it occurs.

Assuming the data looks promising, Fatone hopes it will spin off into larger projects.

“Doing the same project on a larger scale and expanding it means we can look at things we can’t in a pilot grant. Now we’re asking: do the children’s biomechanics change? In a larger study we can ask how and why.”

Postural Control, Balance, and Engineering

Matthew Major, PhD, is interested in applying his engineering background towards health research. A post-doctoral fellow in PM&R, he studies function in individuals with upper and lower extremity amputation.

“Long term, I want to develop rehabilitation therapies and strategies, different prosthetic designs, as well as forming prescription guidelines, with the focus of trying to optimize these interventions and maximize postural control, function, and balance in individuals with amputations,” he says.

Major’s research analyzes how the body moves and assesses dynamics of the body center of mass. As a result of using prostheses, bilateral lower limb amputees typically display exaggerated lateral sway, a side-to-side motion, which may increase their risk of falling. Major also studies balance using clinical outcome measures. He uses human movement analysis with engineering technology to gather information to study proper alignment for postural control.

With the information gathered, Major can create assessments that can be used in clinical medicine. He hopes to expand his research further with other populations, such as patients with traumatic brain injury or stroke.

One study assesses ankle foot orthoses, exploring how the design of the device influences a child’s activity such as getting around in the community. The main outcome measure is step counts to assess activity level and patient reported measures to assess how changes in activity might have changed participation.

With the information gathered, Major can create assessments that can be used in clinical medicine. He hopes to expand his research further with other populations, such as patients with traumatic brain injury or stroke.

One study assesses ankle foot orthoses, exploring how the design of the device influences a child’s activity such as getting around in the community. The main outcome measure is step counts to assess activity level and patient reported measures to assess how changes in activity might have changed participation.
Feinberg Launches Next Generation Sequencing Core

The Northwestern University Feinberg School of Medicine Research Cores Program has a new addition: the Next Generation Sequencing (NGS) Core. The Core, which officially opened in December, provides a range of sequencing options and bioinformatics support to Northwestern investigators.

“High-throughput DNA sequencing enables millions of reads per sample,” says Matthew Schipma, PhD, NGS director. “As the process has matured, costs for this technology have come down dramatically, which has led to greater demand among researchers. Grant review boards, too, now expect to see NGS on proposals. We’re pleased to be able to increase the NGS options available to investigators in Chicago and Evanston.”

Schipma says the NGS Core can access a wide variety of state-of-the-art equipment, including the Illumina HiSeq2000 and Roche 454 FLX. Core services include:

• **RNA-seq**, or "*whole transcriptome shotgun sequencing.*" This technique involves using high-throughput sequencing to look at the expression of genes in samples, to determine, for example, what is turned on or off in specific conditions or disease states.

• **Chromatin immunoprecipitation sequencing (ChIP-seq).** ChIP-seq is a technique to locate the genome-wide binding sites of specific proteins along the DNA.

• **De novo assembly.** Used when an organism’s genetic sequence is unknown, de novo assembly enables bioinformaticists to stitch together DNA sequences to unravel a genome.

The Core places particular emphasis on counseling new users, says [Grant Barish, MD](#), assistant professor of medicine-endocrinology, who serves as scientific advisor to the NGS Core along with [John Crispino, PhD](#), Robert I. Lurie, MD and Lora S. Lurie Professor of Medicine-Hematology/Oncology.

“In some ways we’re a virtual core,” Barish says. “We’ve partnered with the genomics industry’s largest company, BGI, to perform the sequencing for Northwestern investigators and our affiliates at competitive prices. That means the NGS Core and its team of bioinformaticists can focus on providing users the highest level of project planning and analysis, while managing the flow of samples and data.”

Funding for the Core is provided by the Feinberg Research Office and the Northwestern University Office for Research. “There was a clear need for this service among Northwestern investigators, and we were very happy to work with our partners at the University to address it,” says Jeff Weiss, PhD, director of research core planning. “The Cores Program exists to provide researchers access to an evolving array of instruments and services that are beyond the means of individual investigators, and next generation sequencing is a great example of that.”

“We’re thrilled to diversify Feinberg’s sequencing capabilities,” says Rex Chisholm, PhD, vice dean, scientific affairs and graduate education at Feinberg and associate vice president for research, Northwestern University. “The NGS core will provide exciting new opportunities for discovery and learning for researchers at every level, from students to PIs.”

Researchers can learn more about the Core and arrange for a meeting with Schipma and Barish by sending an e-mail to [ngs@northwestern.edu](mailto:ngs@northwestern.edu).
Ninth Annual Lewis Landsberg Research Day

Call for Abstracts

Submission Deadline: Monday, March 4 at 5:00 p.m.

The Ninth Annual Lewis Landsberg Research Day will be held on April 4, 2013 from 1 to 5 p.m. on Chicago campus. Lectures will be held in the Robert H. Lurie Medical Research Building and the poster session will be held in Northwestern Memorial Hospital's Conference Center (3rd Floor, Feinberg Pavilion).

This event is open to researchers in the following categories:

- Faculty
- Graduate students
- MD-PhD students
- Medical students
- Postdoctoral researchers and fellows
- Clinical residents and fellows
- Research staff

Research Day is an opportunity to share your work with colleagues, find potential new collaborators, and get a better idea of the exciting research taking place at Feinberg. Awards will be presented in the areas of clinical research, basic science, public health and social sciences research, and women’s health.

Those interested in participating in the 2013 poster session must submit an abstract online no later than 5 p.m. on Monday, March 4. Registrants will not be able to enter information on the web site after that date. Space is limited and will be assigned on a first-come, first-serve basis.

For more information, please call the Feinberg Research Office at (312) 503-1499 or visit www.feinberg.northwestern.edu/research/news/research_day/index.html.
Over the course of 50 years, Herbert Meltzer, MD, professor in psychiatry and behavioral sciences and physiology, has followed the science. His career in medicine, which spans six decades, has taken him to four universities, resulted in many honors, and brought the world a breakthrough discovery that eventually led to development of the most commonly used drugs for schizophrenia and bipolar disorder.

Today, as director of the Translational Neuropharmacology Program at Feinberg, science is still in the driver’s seat. “Research generates more questions than answers, as it should, and it has become my defining characteristic,” Meltzer said. “That statement is no less true today than it was when I began as a medical student at Yale.”

Beyond various leadership positions at each stop in his career, Meltzer has served as president of the American College of Neuropsychopharmacology (ACNP) and the Collegium International Neuro-psychopharmacologicum (CINP). He has also been an editorial board member at numerous scientific journals.

A psychopharmacologist and biological psychiatrist looking for the common cause of bipolar disorder and schizophrenia, Meltzer’s career is highlighted by his discovery that the drug Clozapine can be used on patients with severe treatment-resistant schizophrenia. In the early 2000s, Meltzer proved that the drug can also be used to reduce the risk of suicide in patients with schizophrenia.

How does your research advance medical science and knowledge?
By carrying out clinical trials that produce solid knowledge that is useful to improve treatment outcomes and by developing knowledge of brain mechanisms that facilitates the research of others.

At what point in your life did you become interested in medicine?
I became interested in college, but could not decide between graduate school in chemistry and medical school. I accepted a fellowship in organic chemistry at Harvard but during the first year, realized it would not fulfill the part of me I associated with being a doctor and helping people directly to overcome illness. It was during medical school that I realized psychiatry, specifically a mix of clinical care and research on schizophrenia and its causes, would be right for me.

How is your research funded?
My research was once funded mainly by the National Institute of Mental Health (NIMH) but now is funded mainly by industry and donations. This is because I am so interested in translating my research into clinical practice, something NIMH does not fund as well.

What types of collaborations are you engaged in across campus?
I am collaborating with faculty in psychiatry and behavioral sciences, physiology, molecular pharmacology and biochemistry, pediatrics, and the Center for Life Processes. I have found collaboration at Northwestern University Feinberg School of Medicine the best of any of the four universities I have been a part of. It is an extraordinary feature of Northwestern.

Who makes up your research team and what role does each individual play in your research?
I have been fortunate to have more than 25 psychiatrists and 20 PhDs work with me in the lab, as well as many able research assistants, some of whom are now themselves eminent researchers. I do not want to single out any specific person because even now there are a large number of people working very hard to accomplish our collective mission.

Which honors are you most proud of and why?
I am most proud of the
Staff Profile: Kirsten Yehl
Administrative Director, IPHAM

What is your educational background?

I have a bachelor’s degree in communication from the University of Illinois, and a masters degree in library and information science from Dominican University.

Library science is a popular graduate degree for research administrators. Librarians support their community by connecting people to information and resources. In an academic research environment, where competition for research dollars is only getting tighter, making information and resources easily accessible is a valuable skill.

You were recently selected by a team of national leaders in research administration to participate in the National Council of University Research Administrators (NCURA) Executive Leadership Program (ELP). Tell us about ELP.

I like this description from the NCURA magazine:

The NCURA Executive Leadership Program offers NCURA members, who have demonstrated a commitment to NCURA through their proven leadership at the regional or national level, an educational opportunity designed to prepare them for consideration of senior leadership positions in the national NCURA organization. The program is designed to develop those leadership traits considered necessary to lead our organization into the future and to ensure future leaders emerge with an understanding of NCURA’s organizational structure, goals, and objectives, as well as executive leadership principles, including recognized best practices of volunteer leadership.

How and why were you selected to participate?

I am passionate about research administration and advancing the profession in the coming years. For years I have volunteered with NCURA in a variety of roles, regional and national: participating on boards, committees, and task forces, presenting sessions and leading discussion groups, and manning so many reception desks, I have lost count by now.

NCURA allows me the opportunity to collaborate with colleagues with similar professional interests to my own. I learn from leaders in the field of research administration, and I have the opportunity to share my knowledge through mentoring and teaching.

I was selected for the ELP based on my passion for the field, professional experience, and commitment to give back to my professional community.

How long have you worked for Northwestern?

More than ten years; my current position is my fourth position here at Northwestern in a succession of research and education administration roles. Moving into research administration was a big jump from my previous experience working in global technology, but I took the plunge and never looked back!

What is your role at the medical school?

I am the administrative director for the Institute for Public Health and Medicine (IPHAM), a newly formed institute created to expand, enhance, and complement new and existing research programs across the Northwestern campus and broader research community.

IPHAM provides a much needed space for research collaborations in the health sciences and will catalyze research programs that address both individual and population health. IPHAM is also home to graduate education in public health, including four master’s degree programs, an integrated doctoral program in the health sciences, and an integrated post-doctoral fellowship.

The founding centers in IPHAM have a strong history of collaboration with clinical departments and partners, and we look forward to building on the strength of our collaborations, while creating new synergies.

What has your experience with IPHAM been like since the Institute was formally created?

Challenging and fun. We have the opportunity to facilitate so many research collaborations across the university and with external partnerships. At the institute level, I have the opportunity to see the broad picture from developing research programs, moving

Continued on pg. 7
NIH News

In January, Sally Rockey, PhD, NIH deputy director for extramural research, posted facts about applications and awards in FY12 compared to FY11.

“Despite a flat budget and complex fiscal times, we maintained last year’s success rate and slightly increased the amount of award dollars that went to research project grants,” she said.

Rockey shared the following data:

<table>
<thead>
<tr>
<th>Category</th>
<th>FY11</th>
<th>FY12</th>
</tr>
</thead>
<tbody>
<tr>
<td>The overall success rate for research project grants (RPGs) stayed the same compared to 2011.</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>The average size of RPGs increased.</td>
<td>$449,644</td>
<td>$454,588</td>
</tr>
<tr>
<td>In 2012, there was an increase in the total amount of funding that went to RPGs.</td>
<td>$15.8M</td>
<td>$15.9M</td>
</tr>
<tr>
<td>NIH received more R01 grant applications.</td>
<td>28,656</td>
<td>29,515</td>
</tr>
<tr>
<td>Success rates for research using the R01 mechanism remained the same.</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>The number of R01 awards increased.</td>
<td>5,264</td>
<td>5,340</td>
</tr>
<tr>
<td>NIH received more R21 grant applications.</td>
<td>13,145</td>
<td>13,743</td>
</tr>
<tr>
<td>Success rates for the R21 mechanism increased.</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>NIH awards for the R21 mechanism significantly increased and reached the highest number of awards ever.</td>
<td>1,694</td>
<td>1,932</td>
</tr>
<tr>
<td>The success rate for center grant applications decreased.</td>
<td>37%</td>
<td>33%</td>
</tr>
<tr>
<td>The average size of a center grant increased.</td>
<td>$1.86M</td>
<td>$1.91M</td>
</tr>
<tr>
<td>Success rates for SBIR grants increased (Phase I success rates shown here).</td>
<td>11%</td>
<td>16%</td>
</tr>
<tr>
<td>The number of research grant applications received by NIH increased and reached the highest level ever.</td>
<td>62,267</td>
<td>63,524</td>
</tr>
</tbody>
</table>

Separately, Francis S. Collins, MD, PhD, NIH director, posted a new guide on scientific procedures and policies.

Meltzer Q&A, continued from pg. 5

awards I received from the American College of Neuropsychopharmacology, the American Psychiatric Association, the American Society for Suicide Prevention, the Brain and Behavior Research Foundation, and Vanderbilt University. These awards reflect the contributions I made that are very important for the practice of psychiatry, leading to life-saving and life-enhancing benefit to millions of people.

Did you ever imagine you’d be where you are today?

After two years of research training at the National Institute of Mental Health, I accepted an offer from the University of Chicago to develop a research program in schizophrenia. When I started I was very uncertain about my abilities and did not anticipate the success I eventually achieved. I derived enormous satisfaction from seeing my work as a clinician lead to helping people with psychosis and having my research produce publishable data.

Do you have any hobbies?

My major interests outside of medicine are music, especially jazz and symphonic music. I play the piano a bit. I also collect photography. I love to travel and have visited more than 50 countries, many as part of my research.

Yehl Q&A, continued from pg. 6

into implementation and policy development for improved healthcare. I am lucky to work with a great team, and the opportunity to collaborate with research professionals who are making a big difference in the public health realm is so rewarding. It’s what we all want in our careers—to know the work we are doing is making a difference.

What do you do in your spare time?

I have two children, both boys, and they keep me busy, especially during basketball season. During the summer we spend a lot of time on our sailboat, Whirlaway. Now that the guys are older I hope we might get to plan some sailing trips overseas or in the Caribbean... but we all need a few more years of practice! Day to day, I’m always trying something new: pottery, stained glass, French cooking, and the list goes on. I like to get my hands dirty, spend time with friends, and keep life interesting.
Where is your hometown?
I am from Woodmere, New York.

What is your educational background?
I attended Bar Ilan University in Ramat Gan, Israel and McGill University in Montreal, Canada, where I received a bachelor’s degree in world religions and philosophy.

What are your research interests?
My research interests involve examining aging trajectories from a multidisciplinary perspective in order to determine how neurodegenerative illnesses, like Alzheimer’s disease and dementia, could be prevented or delayed.
I am also interested in the mechanisms underlying more atypical dementias that onset earlier (before age 65) in the aging process, like primary progressive aphasia and fronto-temporal lobar degeneration.

What exciting projects are you working on?
I am most excited about my dissertation project that is a part of the larger “SuperAging Project” at the Cognitive Neurology and Alzheimer’s Disease Center (CNADC), led by Emily Rogalski, PhD.
The SuperAging Project takes a unique approach: instead of concentrating on what goes wrong in the aging process, the study concentrates on what goes right in the aging process by investigating “cognitive SuperAgers,” individuals over age 80 who demonstrate extraordinary memory and thrive in daily life.

For my dissertation project, I feel fortunate to work under the multidisciplinary mentorship of Sandra Weintraub, PhD, Changiz Geula, PhD, and Rogalski—experts in the areas of neuropsychology, neuropathology, and neuroimaging, respectively. Using cognitive assessment, in vivo neuroimaging, and microscopic analysis of brain tissue, I am probing a specific region of the brain in SuperAgers called the cingulate cortex, a key region responsible for attention, motivation, and memory.
The ultimate goal of this project is to reveal the mechanism of “SuperAging,” which could provide us with strategies for helping ‘normal’ elderly individuals maintain cognitive function, and may even aid in the understanding and prevention of certain dementias.

What attracted you to the Clinical Psychology PhD program?
There really are so many factors; I’ll choose a few. To my knowledge, the Clinical Psychology PhD program is one of the only programs in the U.S. based in an academic medical center and also housed within a department of psychiatry. This setting was attractive to me because it allows students the opportunity to engage in highly translational and multidisciplinary research, while providing clinical training that follows evidenced-based practices.
I was also attracted to the track-specific curricula, mentoring, and clinical practica that the program offers.
Specifically, the Clinical Neuropsychology specialization under the mentorship of Weintraub will provide me with extensive training in neuropsychology in both outpatient and inpatient settings, and research at the CNADC focuses on the study of aging from a multidisciplinary perspective, which matches my interests perfectly.
And finally, my classes overlook Lake Michigan.

What has been your best experience at Feinberg?
My best experience thus far at Feinberg was an incredible seminar I took in behavioral neuroanatomy with Juan J. Cayaffa, MD, emeritus professor of neurology. I took this course in my second year of graduate school, and it solidified in me a desire to dissect, literally, the brain and its behavioral functions. Dr. Cayaffa spoke so passionately and eloquently about the beauty and complexities of the human brain while holding one in his hands. Every session was an inspiring experience!

What do you do in your free time?
In my free time, I enjoy exploring Chicago or just hanging out with friends. My program cohort is a group of five amazing ladies, so we try to get together as often as possible. I also try to visit my family and friends back in New York City.

What are your plans after graduation?
After graduation, I plan to continue my education and training through the completion of a two-year post-doctoral fellowship in Clinical Neuropsychology.
Sponsored Research

**Nicholas Cianciotto, PhD**
**Professor in Microbiology-Immunology**

**Project title:** Immunology and Molecular Pathogenesis (IMP) Training Program

**Sponsor:** National Institute of Allergy and Infectious Diseases

The IMP Training Program (IMPTP) represents Northwestern University’s major source of NIH support for both predoctoral and postdoctoral students committed to basic research in the areas of immunology, microbiology, and molecular pathogenesis. Each year, four predoctoral and two postdoctoral students are appointed to the IMPTP grant. Since its beginning in 1996, this comprehensive program has trained 35 predoctoral and 31 postdoctoral students and played a pivotal role in establishing the area of immunology and microbial pathogenesis as a cornerstone of research at Northwestern.

The IMPTP program, formerly led by **Stephen Miller, PhD**, Judy Gugenheim Research Professor of Microbiology-Immunology and professor in dermatology, is directed by Cianciotto, and now includes 26 preceptors, which is an expansion from the previous period. Participating preceptors are selected on the basis of their research focus in basic immunology and microbial pathogenesis and their track records in maintaining a productive research program and a history of successful pre- and post-doctoral training. This group of investigators collectively currently holds NIH grants totaling approximately $15.2 million a year in direct costs as well as an additional $8.1 million a year in direct costs from non-NIH granting agencies. This total funding represents a 66 percent increase in funding from the training faculty five years ago. Moreover, over the past 10 years, these researchers have trained in total 180 predoctoral and 212 postdoctoral students.

The reasons for continuing the IMPTP are three-fold:

First, immunology and microbiology are essential to our understanding of human health and disease. Infectious disease has long taken an enormous toll on human morbidity and mortality, and its significance has not yet waned. While there still remain unconquered ancient diseases such as tuberculosis, cholera, gonorrhea, and herpes, there are also “new” diseases due to previously unrecognized entities such as HIV and Legionella, and the growing threat of antibiotic-resistant microbes, such as Pseudomonas and Stenotrophomonas, afflicting the growing populations of elderly and immunocompromised individuals. Moreover, another new type of threat has emerged in the form of bioterrorism. And, finally, there is the growing realization that human cancer can in fact have microbial origins, such as HPV and EBV.

Thus, achieving a fundamental understanding of these microbial agents and the immune system is of paramount importance. Yet, recent research has also shown there to be other, equally-compelling reasons for studying the basic workings of the inflammatory response and the immune system. Indeed, in many instances, the innate and/or adaptive arm of the immune system can themselves be pathogenic; e.g., autoimmunity is being linked to multiple sclerosis, diabetes, arthritis, vasculitis, and Chagas’ disease, and chronic inflammation may be yet another trigger for cancer. Finally, also alarming is the apparent rise in various forms of allergy such as asthma and the growing belief that there may be microbial influences upon the development of allergy.

It is within this context that the need for training the next generation of immunologists and microbiologists is seen as being acute.

Second is the pre- and postdoctoral student population at the medical school. The recruitment of top students to Northwestern has been achieved through i) development and maturation of the DGP, ii) recruitment and retention of top-notch faculty, and iii) growth and improvements in infrastructure and institutional support. Coincident with this has been the recruitment of accomplished postdoctoral fellows who also drive the research enterprise and serve as key collaborators and role models for students. Among these trainees is a select subset who is committed to the study of immunology, microbiology, and molecular pathogenesis and who would benefit from the enhanced training that can be achieved through the mechanisms of a T32 training program. Indeed, such training programs bring the very best together and achieve synergy. Through the IMPTP, we aim to provide an enhanced curriculum, a highly interactive and stimulating research environment, an opportunity to interact with leading scientists in their chosen field by hosting outside speakers for visits to Northwestern, a chance to present at an important national conference, instruction in grant-writing and career-development, and a deep appreciation for both responsible conduct in research and the diversity that exists within the research community.

Continued on pg. 10
Third is the fact that the IMPTP is unique at Northwestern. There is no other mechanism or training program at the medical school that fulfills the function nor has the track record of the IMPTP. Six departments within the medical school and four divisions are represented in the IMPTP. Importantly, all of the laboratories are working in close proximity to each other and are intellectually joined together because of a common interest in basic biomedical research that focuses on immunology and microbiology and the interconnections that exist between the two. Given its focus on pre- and postdoctoral training at the medical school in basic research in the general areas of Immunology and Microbiology, the IMPTP is unique among training programs at Northwestern.

Apkar Apkarian, PhD
Professor in Physiology, Anesthesiology, and Physical Medicine and Rehabilitation

Project title: Cortico-Striatal Plasticity in the Transition to Chronic Pain

Sponsor: National Institute of Dental and Craniofacial Research (NIDCR)

This is a grant that was funded through the National Institutes for Health (NIH) Blueprint for Neuroscience initiative through NIDCR, which has the mission of accelerating research in topics that pose Grand Challenges. This grant was specifically funded for the Grand Challenge on Pain to understand the changes in the nervous system that cause acute, temporary pain to become chronic. The initiative was designed to support multi-investigator projects to partner researchers in the pain field with researchers in the neuroplasticity field.

The team was awarded this grant based on their seminal observation that human brain functional properties predispose subjects to transition from acute pain to chronic pain. Their evidence was published recently (Baliki et al. *Nature Neuroscience* 2012), demonstrating that Northwestern researchers can accurately predict (80 percent accuracy) who will become a chronic pain patient one year prior, based on a single measure of the extent to which the prefrontal cortex and brain addiction circuitry are functionally linked with each other.

The grant intends on using this information to pursue mechanistic studies in rats and mice regarding how brain reward circuitry reorganizes in the transition to chronic pain, and how manipulating this circuitry may abrogate the transition to chronic pain. Based on the obtained results in rodents, they will then also conduct a clinical intervention brain imaging-based trial to demonstrate whether the mechanistic information can be directly translated to a clinical intervention.

These studies are a collaboration between Apkarian, Marco Martina, MD, PhD, associate professor in physiology, and D. James Surmeier, PhD, chair, Department of Physiology and Nathan Smith Davis Professor of Physiology.

---

New Imaging Technology, First in the Greater Chicago Area, Arrives at Feinberg

A new state-of-the-art imaging tool, the DeltaVision OMX®, is now available for use at the Northwestern University Feinberg School of Medicine Cell Imaging Facility (CIF). Tom Hope, PhD, professor in the Department of Cell and Molecular Biology, led a group of faculty to secure NIH funding for this Structured Illumination (SIM) based super resolution microscope. This is the first SIM microscope in the greater Chicago area. The OMX is capable of imaging four wavelengths (405, 488, 568, 642) together and utilizes three sCMOS cameras and Blaze technology with fast shutters for high-speed simultaneous imaging in three colors. It is equipped with a heater and CO2 components for live cell imaging, and Ultimate Focus technology for autofocus of samples. With this latest technology researchers can view their samples at more than double the resolution, which cannot be obtained by other methods, potentially revealing new and unique details of their specimens. The system is now installed and running in the Robert H. Lurie Medical Research Center on the ninth floor.

To learn more about the microscope and schedule training contact Kelly Fahrbach at k-fahrbach1@northwestern.edu with OMX in the subject line. Reservation of the OMX is available through the CIF website system.
High Impact Factor Research
November and December 2012


High Impact Factor Research, continued


Research in the News

Voice of America January 23
Road to lymphoma cure could be paved with gold
C. Shad Thaxton and Leo Gordon’s research was featured.

CBS New York January 23
ADHD rises by almost 25% In 1 decade
Craig Garfield was quoted.
► Also mentioned in USA Today, Web MD, The Smithsonian, Washington Times, and more.

Reuters January 22
Melamine tableware may leach chemical: study
Craig Langman was quoted.

The Atlantic January 19
The danger of making science political
Puneet Opal wrote this opinion piece.

Chicago Tribune January 16
Study: Omega-3s ineffective for atrial fibrillation
Clyde Yancy was quoted.

Chicago Tribune January 14
Northwestern unveils $1B research development plan
Feinberg research was mentioned.

FOX News (Chicago) January 10
Who is most susceptible to the flu virus?
Pedro Avila was quoted.

The Wall Street Journal January 8
Ring, buzz, flash: It must be time to take your medicine
Michael Wolf was quoted.

US News & World Report January 8
Diet Drinks Tied to Depression Risk in Older Adults: Study
Eva Redei was quoted.

US News & World Report January 4
Keeping sexuality secret takes mental toll on bisexual men
Brian Mustanski was quoted.

More headlines

Welcome New Faculty

Sarika Jain, MD, joins as assistant professor of hematology-oncology in the Department of Medicine.
Jain received her Doctor of Medicine degree from Southern Illinois University in Springfield, then completed her internship and residency in internal medicine at the University of Michigan, Ann Arbor, and a clinical fellowship in hematology and oncology at Weill Cornell Medical College–New York Presbyterian Hospital.
Jain’s research interests encompass translational research projects investigating novel therapeutics in breast cancer as well as developing new strategies to detect breast cancer relapse.

Parisa Rashidi, PhD, joins as assistant professor in preventive medicine-health and biomedical informatics.
Prior to joining the faculty at Northwestern, Rashidi worked as a research scientist at the University of Florida in Gainesville. She received her doctorate degree in computer science and her master’s degree in computer science from Washington State University in Pullman, Wash. Rashidi also studied artificial intelligence at the graduate level at the University of Tehran, Iran.
Rashidi’s research interests are data mining, machine learning, artificial intelligence, ambient intelligence, context-aware computing, and health informatics. She has published 20 conference papers and articles in peer-reviewed journals and serves as PI on three grants.

Clinical Trials Web Site Reminder

The Feinberg Research Office redesigned the Clinical Trials web page in late 2012. The new page was created with numerous groups in mind, including researchers, administrators, prospective students, and, importantly, research volunteers. The page is a popular destination for medical school web visitors and currently houses a list of department trial and study pages, a list of “trials by condition” with nearly 100 links to diseases and conditions, frequently asked questions, and links to various registries.

The majority of these links take visitors directly to www.clinicaltrials.gov. Additionally, where noted, some “by condition” links take visitors to pages within Feinberg departments, institutes, and centers.

Please review the web page for your department, center, or institute’s presence and send any changes or questions to n-mladic@northwestern.edu.
Funding Opportunities

Exceptional Unconventional Research Enabling Knowledge Acceleration (EUREKA) for Neuroscience and Disorders of the Nervous System (R01)
More information
Sponsors: United States Department of Health and Human Services, National Institutes of Health
Submission Deadline: March 21
Upper Amount: $1 million
Synopsis: This announcement solicits Research Project Grant (R01) applications addressing exceptionally novel hypotheses and/or remarkably difficult problems in neuroscience and disorders of the nervous system. This announcement is for support of new rather than ongoing projects, and is not intended for pilot research. The proposed research may have a high risk of failure, but it must promise results with especially high impact should it be successful. The research should be groundbreaking, innovative, original and/or unconventional, with the potential to solve important problems or open new areas for investigation.

AHRQ Health Services Research Demonstration and Dissemination Grants (R18)
More information
Sponsor: United States Department of Health and Human Services, Agency for Healthcare Research and Quality (AHRQ)
Submission Deadline: March 28
Upper Amount: $1.25 million
Synopsis: The Research Demonstration and Dissemination Grant (R18) is an award made by AHRQ to an institution/organization to support a discrete, specified health services research project. The project will be performed by the named investigator and study team. The R18 research plan proposed by the applicant institution/organization must be related to the mission and portfolio priority research interests of AHRQ.

Featured Events

2.12 Bioinformatics Research Collaboratory Open House
New director, Spencer Huang, PhD, will present bioinformatics resources, analytic tools, and collaboration opportunities in omic research within and outside Northwestern that provide the researcher with in-house expertise to produce studies that result in publications and grants.
Date: Tuesday, February 12, 11 a.m. - 12:30 p.m.
Location: Rubloff Building
Lakeview Conference Rm., 11th Fl.
420 E. Superior St. (Chicago campus)
Contact: g-feng@northwestern.edu
More information

2.21 Tumor Cell Biology Seminar
“From Genomic Questions to Clinical Answers in Cancer,” presented by Kenan Onel, MD, University of Chicago.
Date: Thursday, February 21, 1 to 2 p.m.
Location: Lurie Research Center — Searle
303 E. Superior St. (Chicago campus)
Contact: cancer@northwestern.edu
More information

2.26 Microbiology-Immunology Seminar Series
“Hepatitis C: Is the End in Sight?” presented by Charles Rice, PhD, The Rockefeller University.
Date: Tuesday, February 26, Noon to 1 p.m.
Location: Lurie Research Center — Baldwin
303 E. Superior St. (Chicago campus)
Contact: a-karaba@fsm.northwestern.edu
More information

2.27 IPHAM Wednesday Workshops
“Optimizing Technology – Assisted Intervention for Diabetes,” presented by Charlene Quinn, PhD, RN, University of Maryland Medical School.
Date: Wednesday, February 27, Noon to 1:30 p.m.
Location: Lurie Research Center — Baldwin
303 E. Superior St. (Chicago campus)
Contact: ipham@northwestern.edu
More information

View more funding opportunities

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