Using New Technology to Enhance Behavior Therapies

Imagine you've been inside all day on a Saturday, feeling tired and down, when your phone lights up and beeps. An automated text message pops up on the screen and reads, “Call a friend and go to the park for a relaxing walk.”

That’s the type of message individuals in a clinical trial run by David Mohr, PhD, receive. The participants, all diagnosed with depression, have had their cell phones equipped with Mobilyze, an application that uses sensors to continuously pull live data on information such as location and activity. The collected data recognizes patterns and documents what the individual has been doing and whether he or she has spent time with anyone.

“A lot of the work we’re doing right now is developing these interventions,” says Mohr, professor in preventive medicine and psychiatry and behavioral sciences. Mohr, director of the Center for Behavioral Intervention Technologies (CBITs), believes that harnessing web-based, mobile, and sensor technologies will improve patient behaviors and mental health outcomes.

“We are trying to understand how people interact with these tools, how to improve their functionally and effectiveness, and how to leverage the opportunities these devices might afford us in helping our patients,” he says.

Web-Based Interventions

In addition to Mobilyze, the center has developed a project that uses web-based intervention technology (available Continued on pg. 2
Behavioral technologies, continued from pg. 1

via web sites and smart phones) to teach participants skills to improve their well-being. The program provides education, offers tools that help people implement new skills in their lives, and allows individuals to track their goals. Mohr is also attempting to integrate online peer networks in such programs.

“If a person knows she is accountable to another person with whom she has a supportive and trusting relationship, she is more likely to adhere to the treatment,” he says. “We are investigating how online peer networks can be designed to build interactions between patients with the same behavioral issues to support adherence and enhance learning in online treatment programs.”

Mohr evaluated a networked online program for cancer survivors called Project Onward that integrated supportive-accountability and web-based treatment. Cancer survivors who participated in Project Onward improved more than people who only received web-based treatment. The next step is testing the treatment program in patients with depression and anxiety, as well as adolescents at risk for depression.

Another web-based project provides “virtual humans” (Fig. 1) to patients so they can practice role playing in the comfort of their own home. The virtual human tool may improve social skills for patients with depression or social anxieties. For example, the tool could allow a patient to rehearse common anxiety-inducing interpersonal interactions, such as saying no to requests.

These three projects were developed not only for the treatment of depression in adults, but also for the prevention of depression in adolescents. For most people, depression is a relapsing chronic illness, whereby one depressive episode is more likely to lead to a second, and so on.

“By preventing depression in adolescents you can potentially decrease their vulnerability and prevent the emergence of depression throughout the lifespan,” he says.

Mohr believes that web-based and mobile interventions are potentially important vehicles for providing treatment. Using these tools can extend care, improve standard treatments, is cost effective, and makes treatment available to a larger population, he says.

“Certainly talking with a therapist in a clinic can be very effective, but that is usually one 45-minute session each week, in an office outside of the person’s environment,” says Mohr. “Mobile devices extend care to the environment where the patient lives, prompting them to engage in the behaviors we think will improve their care.”

Changes, Collaboration, and the Future

Mohr developed these interventions through a number of cross-disciplinary collaborations. Mobilyze was the result of discussions with Darren Gergle, PhD, associate professor in the Departments of Communication Studies, Electrical Engineering, and Computer Science, and director of the Collaborative Technology Laboratory.

“Cross-disciplinary interactions are a terrific way of generating new ideas,” Mohr says. “A lot of innovation occurs at the intersection of those disciplines.”

Mohr now faces the challenge of discovering how people interact with mobile devices in the context of health-related behaviors, and then using that information to improve his interventions.

“Most people think that if a patient goes into therapy or counseling, he or she should be ready to work at it. But that is not how people use technology. People use technology to make their lives easier,” he says.

Mohr thinks the future of behavior intervention treatments lies in learning how to harness technologies that people are already using to gently nudge behaviors to improve health and well-being.

“We want to understand how we can develop mobile devices that can be integrated into the fabric of people’s lives,” he says. “Ideally, the applications will meld into people’s daily routines and nudge them a bit to guide their behaviors.”

“Regardless of what the clinical target is, whether changing your food intake or engaging in physical activities, the behavioral intervention principles are fairly similar, so I think a lot of our work can be translated,” he says.
Building a Culture of Innovation at Feinberg

A culture of entrepreneurship has begun to crystallize at Northwestern University Feinberg School of Medicine. Alicia Loffler, PhD, executive director of Innovation and New Ventures Office (INVO) and associate vice president of research, says she saw untapped potential for entrepreneurship at Feinberg and focused efforts to increase the amount of inventions, licenses, and startups generated from the medical school — especially in the area of medical devices.

“It’s amazing how much of an increase in activity we have had since last year,” said Loffler. “At the university, we have been putting infrastructure in place to keep the concepts coming in. We created the office to make sure the inventions got to the public.”

The INVO team scouts Feinberg for research that could have commercialization potential and provides guidance and resources for scientists and clinicians interested in bringing ideas and products to market.

In the past, only 36 startups have been created at Northwestern University, and only two have some affiliation with Feinberg. However, during the past year, the majority of potential startups have come from Feinberg.

“When we think of great medical schools, they all produce great innovations,” says Loffler. “The most important thing that entrepreneurs bring to the school is the ability to deliver research to the patient. You cannot do that unless you know how to bring the product to the market and commercialize it.”

INVO utilizes “entrepreneur residents” to oversee distinct innovation platforms such as therapeutics, chemistry, or software. One such platform, medical devices, has seen a threefold increase in inventions in the past year.

Maryam Saleh, PhD, invention manager at INVO, oversees the medical device initiative and the Center for Device Development (CD2). She attributes the increase to a bio-design-inspired fellowship program where medical students and biomedical engineers partner to assess and design solutions to needs in the industry.

“I’m excited because there is a lot of potential for Northwestern to be a part of the development of the medical device industry in the Midwest,” Saleh says. “These fellows promote an entrepreneurial ecosystem in the University and inspire faculty and students to innovate.”

The Center helps develop medical device ideas by partnering with product design firms and assists inventors to build a regulatory and reimbursement strategy.

“The faculty at Feinberg are all innovators. They come up with really great ideas and are excited about innovation. Surgeons and clinicians have a good understanding of a need and the market, but need help developing the concept and devices,” Saleh says. “Moving forward we would like to get to the point where we further develop the concepts into medical products, clinically test them, turning them into commercially viable technologies.”

Community-Engaged Research Poster Session

In late April, 21 community-academic teams supported by the Community-Engaged Research Center of the Northwestern University Clinical and Translational Sciences (NUCATS) Institute showcased their research findings at the Third Annual CERC Poster Session. More than 75 community members and Northwestern faculty and staff filled the Hughes Auditorium to learn about and celebrate the research that CERC supports, and to emphasize the importance of community-engagement in medical research.

The day was complemented with a keynote address from a community-academic team from Atlanta on the role of community-engaged research in addressing health disparities.
Greenland Passing Reins of NUCATS Institute

As founding director of the Northwestern University Clinical and Translational Sciences (NUCATS) Institute, Philip Greenland, MD, Harry W. Dingman Professor of Cardiology, helped launch an organization specifically designed to cultivate collaborations across Northwestern. After overseeing years of successful partnerships between University schools, the community, and Feinberg's clinical affiliates, Greenland has indicated a wish to relinquish his role as institute director.

Greenland will continue to hold the Dingman Professorship, and Donald Lloyd-Jones, MD, ScM, preventive medicine chair, will become the new director of NUCATS and the senior associate dean for clinical and translational research at the medical school.

“Establishing the NUCATS Institute was a monumental and satisfying assignment,” said Greenland, professor in preventive medicine and medicine-cardiology. “The chance to refocus on my research while still watching NUCATS continue to grow will be another exciting time in what has been a great career at Feinberg.”

Since launching in 2007, the NUCATS Institute has represented a significant collaborative effort involving faculty from six Northwestern schools, as well as four clinical affiliates. In May of 2008, Greenland became principal investigator for a $30 million Clinical and Translational Science Award (CTSA) from the National Institutes of Health – the third largest NIH award the medical school had ever received.

“Phil has done a remarkable job creating NUCATS from scratch, transforming the clinical and translational research enterprise at Northwestern, and setting the stage for a strong effort to renew the CTSA grant,” said Rex Chisholm, PhD, vice dean of scientific affairs and graduate education.

Under Greenland’s leadership, NUCATS has evolved into a successful and distinguished institute that continues to be a critical component of the Northwestern University research enterprise. Components of NUCATS, like Science of Team Science research and the Community-Engaged Research Center, now play significant roles in the development of ever-increasing collaboration at Northwestern.

“Dr. Greenland has displayed exceptional leadership in growing NUCATS into an integral part of our research initiatives,” said Eric G. Neilson, MD, Northwestern University Feinberg School of Medicine vice president for medical affairs and Lewis Landsberg Dean. “The institute has become a fundamental link in Northwestern University’s clinical and translational research enterprise by accelerating translation innovation as a member of the CTSA consortium.”

Lloyd-Jones, whom Greenland recruited from Massachusetts General Hospital in 2004, said he will continue to learn from the institute’s first and only director.

“The opportunities and environment that Phil has created for clinical and translational researchers at Northwestern, and the knowledge that he has imparted will guide my leadership of the NUCATS Institute,” Lloyd-Jones said. “I am grateful and excited to become a part of the team responsible for catalyzing health research collaborations across the University.”

New MSTP Assistant Director Announced

The Medical Scientist Training Program (MSTP) has named Jayms Peterson, PhD, assistant director effective July 1.

Peterson earned his doctorate degree in neuroscience from The Rosalind Franklin University of Medicine and Science after completing undergraduate education at the University of Illinois. He then completed a postdoctoral fellowship at Baylor College of Medicine. Since 2005, he has worked with James Surmeier, PhD, chair of the Department of Physiology at Feinberg, as a research associate focused on synaptic receptor physiology and calcium imaging. Peterson has published numerous manuscripts in leading journals over his career.

In addition to a strong research background, Peterson completed the Searle Center for Teaching Excellence Graduate Teaching Certificate Program at Northwestern, and has taught undergraduate biology at Lake Forest College. He is a highly regarded mentor to numerous graduate students and postdoctoral fellows in the Surmeier lab, including MSTP students.
Melissa Simon, MD, MPH, assistant professor in obstetrics and gynecology, preventive medicine and medical social sciences, doesn’t need a translator to understand hopelessness.

Whether in Detroit or the Dominican Republic, China or Chicago, the predominance of health disparities among low-income, medically underserved women acts as the impetus for her role as clinician, researcher, and humanitarian.

Growing up in an impoverished neighborhood in Michigan’s largest city, Simon saw firsthand what it was like not to have one’s needs met, particularly with respect to health and disease. She’s seen it in Mexico and Zimbabwe, too; the issue is as much a national concern as a global problem.

A report in 2009 showed that low-income American women not yet old enough for Medicare are four times more likely to be in poor or fair health, according to the Center for Health Policy Research.

Simon, who came to Northwestern to complete a fellowship, in family planning and reproductive health before joining the Feinberg faculty in 2006, received her doctorate at Rush Medical College, completed an obstetrics and gynecology residency at Yale-New Haven Hospital, and a mini-fellowship in geriatric medicine at Johns Hopkins.

“The goal of my research is to not only help those who are underserved across the lifespan, but to integrate the findings into a larger, impactful level of policy,” she said.

What is your professional focus?

My career has been centered on promoting health equity through true community engagement among low-income women across the lifespan.

I grew up in a very poor part of Detroit, and from those powerful experiences stem my sincere desire to work with and expand research on populations, especially women, who are considered disenfranchised and medically underserved. I have led many student organizations focusing on community organizing, women’s and immigrant’s rights, and cultural barriers to obtaining health care.

Aiming to approach health care research from a broad public health perspective, I worked at the Chicago Department of Public Health and published several white papers and community reports on a variety of topics essential to minority health in Chicago. As an Albert Schweitzer Fellow, I focused on stress and depression among patients in a free Chicago clinic. I have also worked around the world in Mexico, the Dominican Republic, Zimbabwe, and China delivering health care and researching locally relevant topics to improve the health of the underserved.

What are your research interests?

Having worked in many developing countries and in many impoverished communities in the U.S., I am an ardent advocate of partnering with my patients and their communities to achieve optimal health. I hold a strong interest in leveraging research to empower, improve the health, and advocate for low-income, medically underserved women.

My research aims to merge social epidemiology principles with health services research to reduce health disparities through a community-based participatory research framework. I am the principal investigator for several federal and foundation grants on barriers low-income women face in obtaining cancer treatment across the care continuum and on patient navigation-based interventions to overcome these barriers. My research also seeks to mitigate the health related poverty trap among family caregivers through inbuilt economic resilience options.

Why have you chosen to work with underserved communities?

Health and education are transformative and are essential human rights. Community engagement is an essential vehicle through which health and education can be optimally achieved. To this end, my research approach is rooted in community engagement, and I firmly believe engaging the community is an essential component of translational research and one of the most optimal approaches with which to conduct dissemination and implementation research.

Research that is performed on the bench and that subsequently makes it to the bedside, does not always apply to all individuals. Many minority and underserved communities, in particular, are often not included in cutting-edge, basic science, clinical trial, and behavioral intervention research for a variety of reasons, including access to participation, not fitting

Continued on pg. 6
the study inclusion criteria, and personal fear or mistrust of participation in research.

I truly believe that community research enterprise is an essential component of all research, and without it, all of the high tech research projects with millions of dollars of funding, remain in the ivory tower and do not concur benefit on the populations that are most in need. My research approach and expertise act as a broad-band connector and aims to facilitate the dissemination, tailoring, and implementation of such research studied in majority populations to minority and harder to reach populations.

Who inspires you?

I obtain deep inspiration from a wide range of people, especially those who have faced and overcome adversity like my own personal and family experiences. All of the patients and community members with whom I have worked around the world have deeply touched my life and provide inspiration. Given where I started and where I am now, I am very fortunate to have had so many mentors and supporters throughout my life. I have been especially privileged to have received mentorship and guidance from several faculty members here at Northwestern. Of greatest importance, though, is the support and love from my husband, four children, and family.

You were recently selected as the Institute of Medicine Fellow; on what will your work focus?

The Institute of Medicine (IOM) nominated me as the 2011-2013 Norman F. Gant/American Board of Obstetrics and Gynecology/IOM Anniversary Fellow in recognition of my work toward health equity for uninsured and publicly-insured women. I am the second national recipient of this award.

As a fellow, I am working with the IOM’s eminent researchers, policy experts, and clinicians from across the country as they collaborate on initiatives convened by the IOM to provide nonpartisan, evidence-based guidance to national, state, and local policymakers, academic leaders, health care administrators, and the public. The fellowship program provides an exceptional learning and professional development opportunity for my career. As an IOM Anniversary Fellow, I continue with my main academic responsibilities while engaging part-time over a two-year period in IOM’s health and science policy work.

What is your most recent project?

My work focused on patient navigation and community health worker (CHW) models has grown substantially since I started at Feinberg. My lab has been successful in garnering continuous NIH funding to adapt my career development award work on cancer patient navigation to four different levels. We started with clinic- and hospital-focused patient navigation and then moved to a model of a unit of free-standing navigators/CHWs that move fluidly throughout DuPage County, focused on uninsured women with breast or cervical cancer.

Second, we were awarded an NCI R01 focused on the cultural adaptation, application and dissemination of patient navigation across the cancer care continuum among Chinese women in Chicago. This work will be connected to my visiting professorship at Peking Union Medical College in Beijing this summer.

Third, this body of navigation research has progressed beyond cancer to uninsured patients with diabetes and hypertension.

Fourth, our navigation expertise has recently been recognized by the governor with an appointment to the body charged with implementing the statewide breast cancer screening and treatment quality law, and we are now leading the statewide implementation and evaluation of breast cancer patient navigation.

Welcome New Faculty

Deborah Rooney, PhD, MAMS, joins as assistant professor in medical education and faculty development.

Rooney previously was a clinical research associate in the Department of Surgery at Feinberg, and manager of the Northwestern Center for Advanced Surgical Education. Prior, she served as a computer-aided instruction specialist/project manager and adjunct faculty, biomedical visualization, at the University of Illinois. Rooney received bachelors of arts and science degrees from Michigan State University before completing her Master of Associated Medical Sciences degree from the University of Illinois. She received her doctorate degree in education psychology from the University of Illinois in 2011.

Rooney’s research interests include the development of new performance rating scales and evaluating associated validity evidence, evaluating the use of non-clinicians for rating clinical performance, and the effects of using simulation for team training in surgery.
**Staff Q&A: Anita Chase**  
Executive Assistant, Office of the Dean

Where are you originally from?  
I’m from Wichita, Kan., and have lived in Chicago since fall 2000.

What is your educational background?  
I have a bachelor of arts degree in music, with a minor in anthropology, from Wichita State University, and a pre-physical therapy program certificate from Northwestern University.

Please tell us about your professional background prior to your current position.  
I have had many other jobs prior to Feinberg, since I tried to avoid a full-time job so I could focus on my music career (... everything from telemarketing to temping as a costumed mascot). I have also had a few full-time jobs; most notably office work and child care for a social services organization and office/cashiering/reception for a luxury car dealership.

Here at Northwestern, I worked as a department assistant in the central budget and planning office prior to coming to the Feinberg Dean’s Office.

Why did you choose to work at Northwestern?  
I worked for the registrar’s and chair of music’s offices at Wichita State University, and enjoyed being at an institution that was created for the purpose of learning. Once I decided I was going to need to work full-time, I started looking at universities. I had heard of Northwestern’s great reputation and I wanted to go back to school, so the employee tuition discount was a big plus too. I love the chance to attend lectures, art exhibitions, concerts, and other events I probably wouldn’t even know about if I didn’t work here.

What is your role at the medical school?  
I assist Feinberg Communications with various tasks and projects.

What professional activities do you take part in?  
I am a former member of NUSAC and ANUW, and have assisted with a couple of past Take Our Daughters (and Sons) to Work Days. I also have served as the United Way campaign manager for my department for several years.

What is your favorite part of the job?  
I enjoy the chance to work with and get to know many people from various departments in the university. (My favorite anthropology studies in college were based on the cultural aspect.) I also like the challenge of continuously learning new skills for the many different kinds of tasks I am responsible for.

What do you do in your spare time?  
When I am not at Northwestern, a large portion of my time is spent continuing to pursue my music career. I have been playing guitar and singing with my rock band, ½ Mad Poet, since 1995. I have also been performing with the folk rock band, Matthew Morgan and the Lost Brigade, for the past year and a half. In between those gigs, I also occasionally play solo acoustic shows. Other than that, I like to read, write, and wander (preferably road trips to places I have never been).

---

### Faculty Featured in HBO Documentary

Donald Lloyd-Jones, preventive medicine, and Jon Lomasney, pathology, were featured in part one of a four-part series examining the scope of the obesity epidemic in the United States and exploring the serious health consequences of being overweight or obese.

*The Weight of the Nation: Confronting America’s Obesity Epidemic* aired parts one and two on Monday, May 14. Parts three and four aired on Tuesday, May 15. All four parts are available for viewing [online](https://www.northwestern.edu/).
Student Q&A: Samuel Light, Driskill Graduate Program

Where is your hometown?
I’m from Berkley, Calif.

What is your educational background?
I followed a somewhat unconventional path. In 2008, I received a bachelor’s degree in psychology from Bard College and began graduate training in Northwestern’s Interdepartmental Neuroscience Program (NUIN). To the program’s credit, first year students were encouraged to rotate in laboratories with a range of research interests. I rotated in the laboratory of Wayne Anderson, PhD, professor in the Department of Molecular Pharmacology and Biological Chemistry and was thoroughly impressed with the biochemical/structural techniques the lab was applying and the results they were generating. Based on this experience, I made the decision to join the Anderson laboratory, and as the lab lacked a strict neuroscience focus, transfer to the more generally focused Driskill Graduate Program.

On what does your research focus?
In the Anderson lab, my research has focused on the enzymes that comprise the biosynthetic shikimate pathway, which catalyzes the first steps in the synthesis of the aromatic amino acids. As these enzymes are essential in a number of pathogenic bacteria but lack mammalian counterparts, they represent logical targets for the design of novel classes of antibacterials.

Relying upon several structural and biochemical techniques, we’ve approached the study of these enzymes from multiple fronts. Initial studies sought to discern the catalytic mechanism of one of the shikimate enzymes, dehydroquinate dehydratase. These findings raised a set of questions that have lead down an unanticipated course to address the general mechanics of covalent bonds formation within biological macromolecules.

We’re currently preparing a manuscript that relies upon basic physical chemistry concepts to predict and test a set of surprisingly complex conformational changes associated with protein covalent bond formation. In addition, because of their obvious therapeutic potential, we’ve been working towards identifying small molecule inhibitors of the shikimate pathway enzymes.

What has been your best experience at Feinberg?
The first steps in protein crystallography (the primary technique utilized in the Anderson lab) serve no other purpose than to advance the process towards the ultimate goal of determining a protein’s structure. It can be a frustrating and drawn-out process. When this investment of time and energy finally pays off and you’re able to obtain the necessary data, the first view of the protein’s structure is extremely exciting. It is very much an explorer/frontier-type mentality. The knowledge that you’re the first person to see the inner workings of a protein that is essential for life as we know it is genuinely thrilling. I’ve been lucky enough in my research to have a couple of these experiences.

What are your plans for after graduation?
I won’t pretend to have it completely figured out. In the short-term, I’ll presumably find a postdoctoral fellowship. In the longer-term, I would like to stay active in academic science, perhaps in a faculty position.

Connect with Samuel on LinkedIn.

NIH Requires Grant Acknowledgements

NIH is working to create greater transparency about research being funded by taxpayers’ money by providing a database identifying NIH research efforts. In order to populate this database, the agency requires NIH-funded research to identify the NIH and the funding institute, such as the National Cancer Institute.

NIH also has asked its grantees to include the grant numbers or, in some cases, contract numbers, as well as to identify any general support given Northwestern or other institution that performed the research, such as the cancer center core grant, for example. This information is required in all publications including press releases, blogs, research publications, and any other articles from Northwestern.

The database of NIH grant articles can be found at www.report.nih.gov. The agency reports that this database is now widely used by the media, advocates, and policymakers in identifying NIH research efforts and communicating the value of taxpayer-funded research.
Sponsored Research

David Klumpp, PhD
O’Connor Family Research Professor of Urology and Associate Professor in Urology and Microbiology-Immunology

Project title: “Microbiomes of Interstitial Cystitis”

Sponsor: National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK)

Interstitial cystitis/bladder pain syndrome (IC) is a debilitating condition associated with severe pelvic pain and the need to urinate frequently and urgently. These symptoms are so severe that IC patients typically score lower on quality-of-life assessments than patients on chronic dialysis for renal failure. Unfortunately, the etiology of IC remains unknown, and no effective therapies exist.

The Multi-Disciplinary Approaches to Chronic Pelvic Pain (MAPP) Network is a major clinical and basic research effort of the NIDDK to study IC patients and basic research models in the context of other chronic pain conditions. Klumpp and Anthony Schaeffer, MD, chair of the Department of Urology, direct the Northwestern center within the MAPP Network. NIDDK also recently solicited applications to develop interdisciplinary teams capable of addressing novel questions about IC not currently under study through MAPP. Klumpp and Schaeffer were fortunate to receive one of only two such exploratory awards from the NIDDK for their proposal to study how microbial flora influence IC.

Klumpp’s group is among the first to examine pain responses to infectious disease. By marrying the fields of microbial pathogenesis and pain neuroscience, these studies have led to identification of receptor-ligand interactions that mediate bladder-associated pelvic pain. Their findings have demonstrated that bladder-associated pain is subject to modulation by the GI tract through the process of organ crosstalk. Moreover, they find that bacteria can elicit diverse pain responses, from acute pain to chronic pain to suppression of pain.

In addition to the known roles of specific pathogens in acute infection, bacteria are increasingly understood as critical to normal tissue function. Indeed, bacteria far outnumber human cells in our bodies, and many body niches are occupied by diverse microbial flora, or “microbiomes.”

Although a relatively new field, the importance of studying microbiomes is highlighted by the NIH emphasis of the Human Microbiome Project as an NIH Common Fund initiative to define the microbial diversity at various body sites in both healthy individuals and during disease. Already, altered microbiomes in the GI tract have been shown to mediate obesity and forms of colitis, findings that have suggested novel therapies.

Given that Klumpp’s group finds bacteria modulate pelvic pain and can do so via organ crosstalk, the current study will determine whether IC patients exhibit altered GI or vaginal microbiomes relative to healthy controls and whether any such alterations modulate pelvic pain in mouse models. These novel and interdisciplinary studies involve recruiting IC patients and controls through the Urology Clinic of Northwestern under the direction of Schaeffer. Fecal and vaginal swab samples from study participants will be cultured in Klumpp’s lab for use in mouse studies. These clinical samples will also be sent to the laboratory of Bryan White, PhD, in the University of Illinois at Urbana-Champaign. White is a leading expert in defining and analyzing GI and vaginal microbiomes and investigator in the Human Microbiome Project. He will employ cutting-edge analytical tools to identify and describe altered microbiomes associated with IC.

Together, these studies will determine the role of altered microbiomes in IC pathogenesis by comparing patient symptoms with bacterial diversity in the GI and reproductive tracts. This work will also set the stage for additional studies to define mechanisms of microbiome modulation of pain with the hope of developing novel therapies for IC.

NIH News

- Sally Rockey, PhD, NIH deputy director for extramural research, has posted new data concerning the success of PhD investigators in obtaining grants by institution type. The data shows, “investigators with a PhD at medical schools and research institutes fare better (by several percentage points) when compared to investigators with a PhD at institutions of higher education (not including medical schools).”

- The NIH Office of Extramural Research has added eight additional FAQs concerning implementation of the new conflicts of regulations. Almost 100 FAQs are now available. OER has also posted an updated tutorial on the regulations.
Sponsored Research, continued

Scott Budinger, MD
Associate Professor in Medicine-Pulmonary and Cell and Molecular Biology

Project title: “Signaling in the Lung Induced by Particulate Matter Air Pollution”

Sponsor: National Institute of Environmental Health Sciences

Exposure to particulate matter air pollution (PM) remains a major public health concern. In the past five years, several independent groups of investigators have linked increased levels of air pollution with a growing number of adverse health outcomes including all-cause mortality, cardiovascular mortality, accelerated atherosclerosis in postmenopausal women, the loss of lung function in healthy adults, impaired lung development in children, pneumonia, exacerbations of asthma, and COPD and venous thromboembolism.

As part of a long-standing collaboration, Budinger and Gokhan Mutlu, MD, associate professor in medicine-pulmonary at Feinberg, found that in mice exposed to air pollution from Chicago, lung macrophages release IL-6, which is required for the development of an increased tendency to arterial thrombosis. These findings provided a novel and innovative mechanistic framework to explain how air pollution might result in excess heart attacks and strokes, which are the major drivers of air pollution-related mortality. Several groups of investigators have subsequently confirmed the importance of these findings in humans.

This award provides support to examine the in vitro and in vivo mechanisms by which exposure to air pollution causes the release of IL-6 from alveolar macrophages and the molecular pathways that modulate this response. With Murali Prakriya, PhD, assistant professor in molecular pharmacology and biological chemistry, Budinger and his collaborators Mutlu, Navdeep Chandel, professor in medicine-pulmonary and cell and molecular biology, and Harris Perlman, PhD, associate professor in medicine-rheumatology, have found that the opening of Ca2+ release-activated Ca2+ (CRAC) channels is required for this response. This IL-6 release is modulated by the pro-apoptotic protein Noxa, ligation of the CXCR2 receptor and activation of the β-adrenergic receptor in lung macrophages.

In this project, we will elucidate the molecular mechanisms linking these pathways and use genetic mouse models to determine their importance in vivo. The pharmaceutical industry has identified many of the pathways we have found to be important in the response to PM as targets for drug development. Our studies will allow us to predict whether these agents are likely to modulate the cardiovascular response to inhaled particles.

High Impact Factor Research: April 2012


Research in the News

The New York Times  May 25
A game to help doctors ask tough questions
Michael Fleming’s work was featured.

FOX News (National)  May 24
Daily rhythm disruptions linked to fertility problems
Keith Summa’s research was featured.

ABC News (National)  May 21
USA Today  May 21
US News & World Report  May 22
MSN Health & Fitness  May 22
CBS News  May 22
Scientific American  May 22
Northwest Public Radio  May 26
The Atlantic  May 27
Spider phobics fold big, hairy tarantula, Florence
Katherine Hauner’s research was featured.

US News & World Report  May 21
Is boosting your HDL to cut heart disease a lost cause?
Philip Greenland was quoted.

ABC News (National)  May 18
Is boosting your HDL to cut heart disease a lost cause?
William Catalona was quoted.

MSNBC May 13
Washington Post  May 12
Height, weight -- BMI? Doctors urged to treat body mass index as a vital sign
Robert Kushner was quoted.

Chicago Tribune  May 9
My stroke: Sen. Mark Kirk writes about his illness and rehabilitation
Richard Fessler was mentioned.

Boston Globe  May 8
Research suggests self-disclosure is rewarding
Hans Breiter was quoted.

More headlines

Hats Off to the 2012 Graduates

The Driskill Graduate Program in the Life Sciences, Northwestern University Interdepartmental Neuroscience Program, Medical Scientist Training Program, and Physical Therapy PhD program have begun to confer doctorate degrees to the class of 2012 during ceremonies on the Chicago and Evanston campuses, held at various times throughout the Spring. The faculty and staff of Northwestern congratulate these students on their well-deserved achievement.

Students who have been profiled in these pages during their years at Feinberg linked to their web profiles.

Driskill Graduate Program (DGP)
Hans Arora
Yaw Bediako
Timothy Chlon
Louis Dore
Terry Fitzpatrick
Daniel Gallo
Rocco Gogliotti
Laura Hix
Chia-Lin Hsu
Vanderlene Kung
Mindy Leelawong
Danijela Maric
Kessler McCoy-Simandle
Samuel McBrayer
Terry Medler
Kristen Mighty
Sean Pyper
Denitsa Savakova
Mario Shields
Joseph Tiano
Eugene Wyatt

Medical Scientist Training Program (MSTP)
Alison Christy
Kevin Gobeske
Alan Lewis
Sean Pyper
Cory Simpson
Sarah Umetsu

Northwestern Interdepartmental Neuroscience Program (NUIN)
Justin Catches
Karrie Fitzpatrick
Grant Flowers
Timothy Jaramillo (Fall ‘11 graduate)
Kelly Jones
Yujin Kim
Taro Kiritani
Brian London
Cheryl Park (Fall ‘11 graduate)
Laura Wittig

PT/PhD Degree (PT Departement)
Theresa Sukal Moulton
Funding Opportunities

Clinical Trial Award - Rehabilitation
More information

Sponsors: United States Department of Defense (DOD) Department of the Army, Army Medical Research and Materiel Command (USAMRMC), Congressionally Directed Medical Research Programs (CDMRP)
Spinal Cord Injury Research Program (SCIRP)
Submission Deadline: Req preliminary proposal July 15
Upper Amount: $813,000

Synopsis: The award supports rapid implementation of Phase 0, I, or, II clinical trials with the potential to have a significant impact on the understanding of spinal cord injury (SCI) and amelioration of its consequences. All studies must be focused on rehabilitative aspects of SCI, and be applicable to the health care needs of military service members, veterans, and/or their caregivers and family members.

Only one Nested New Investigator (NNI) can be requested per proposal. The SCIRP is offering opportunities for training of graduate students, medical students, residents, postdoctoral fellows, and clinician-scientists new to SCI research, as an option for the award. The intent of the NNI option is to provide mentored research opportunities in SCI research. It is expected that the training will provide new investigators with a meaningful and productive experience in SCI research.

Basic Science Award - Diabetes
More information

Sponsor: American Diabetes Association (ADA), ADA Research Funding Program, Nationwide Research Awards
Submission Deadline: July 16
Upper Amount: $345,000

Synopsis: These awards provide grant support to new and established investigators and to investigators who have not previously worked in the field of diabetes and have an imaginative proposal related to any aspect of diabetes research. Applications will be considered in any area that is relevant to the etiology or pathophysiology of diabetes and its complications. Applicants must be United States citizens or possess (or have applied for) permanent resident status. One person must be specified as the principal investigator (PI). The ADA does not permit Co-PIs.

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