Urology Translates Novel Research to Patients, Develops Scientists

“There’s a story behind the research we do and why we’re doing it,” says Anthony Schaeffer, MD, chair of urology and Herman L. Kretschmer Professor of Urology. “This is one of the few departments which has emphasized research for more than 50 years and continues to do it in a variety of ways.”

Indeed, Northwestern University Feinberg School of Medicine’s Department of Urology, ranked third in the U.S. for National Institutes of Health (NIH) funding, has developed a diverse array of research, including the areas of inflammation, pain, the microbiome, angiogenesis, nanotechnology, and cancer.

Schaeffer attributes this success to the department leadership’s participation in basic science research and support of urology residents and faculty. He believes research should be an integral part of the residency program, and allows residents to take an additional year to conduct research without clinical responsibilities.

“This has been a very successful model not only in achieving important discoveries, but also shaping careers of individuals. Many of our residents have gone on in academia to lead departments,” he says.

Students and residents also pursue discovery as faculty at Northwestern. Innovative Northwestern-trained urology investigators such as C. Shad Thaxton, MD, PhD, who creates new medical diagnostics and therapeutics using nanoparticles, and Joshua Meeks, MD, PhD, who studies genetic mutations in bladder cancer, have published groundbreaking research and attracted significant NIH funding.
Understanding Risk Factors for Prostate Cancer

A family history of prostate cancer and time spent helping his mother with community health projects as a child led Adam Murphy, MD, MBA, assistant professor of urology, to specialize in health disparity research.

“Minority men need people to focus on their health. There are a lot of unanswered questions on why African American men have more aggressive forms of prostate cancer, and I want to contribute to that discovery process,” says Murphy.

Murphy’s research focuses on vitamin D deficiency as a risk factor for prostate cancer. While examining the effects of Vitamin D levels and related genetic polymorphisms—sun exposure, skin color, and risk of aggressive prostate cancer—he found that vitamin D levels can predict biopsy outcomes in prostate cancer patients.

The study, funded by the Department of Defense, also showed that deficiency in the vitamin increased the grade and tumor stage of prostate cancer. While the same patterns were shown in both African American and Caucasian men, the effects of vitamin D levels were bigger in African Americans. Also, vitamin D levels were shown to be a predictor of cancer diagnosis in the African American population, while it was not a predictor in the Caucasian population.

Murphy recently received a five-year Veterans Administration Career Development Award to further explore his findings.

“Chronic vitamin D deficiency increases the risk of prostate cancer in the African American population,” he says. “Caucasian people are more efficient in processing the vitamin. In darker skin, the melanin blocks the sun’s rays, and in areas such as Chicago where people have less exposure to the sun, there is a higher chance of chronic vitamin D deficiency.”

He hopes his research will contribute to personalized medicine.

“Many health disparities have a genetic basis and environmental influences. I want to individualize people’s risk factors and create tailored medicine for everyone.”

Treating Chronic Pain in UTI and Interstitial Cystitis

David J. Klumpp, PhD, associate professor of urology and microbiology-immunology, focuses on novel approaches to managing chronic pelvic pain.

In urinary tract infection, patients are treated with antibiotics, which kill the infection but do not alter the pain response. To combat this problem, Klumpp is developing a probiotic approach; he believes certain bacteria with anesthetic effects may work as a pain treatment.

In another condition known as interstitial cystitis (IC), Klumpp has recently identified a gene responsible for pain severity in mice which modulates arachidonic acid, or AA, (a polyunsaturated omega-6 fatty acid) levels. The metabolism of AA causes an inflammation response in animal models, which leads to pain. Therefore, he believes by controlling AA in humans, pelvic pain may be controlled in patients.

Klumpp’s research has also revealed that the AA pathway is a key modulator of depression. He believes that both pain and depression can be treated through the microbiome of the gut, and in mouse models has shown that switching the bowels of healthy mice with the bowels of mice affected with IC can treat the pain.

From Research to Outcomes

Research into personalized medicine and more efficient technologies can lead to improved patient-reported outcomes. Schaeffer works with David Cella, PhD, chair of the Department of Medical Social Sciences and director for the Center for Patient-Centered Outcomes, to bring research findings to patient care.

“When a man is told he has prostate cancer, instead of saying ‘you should have this type of surgery,’ we have developed systems to allow us to better satisfy this individual,” Schaeffer says. “We can personalize medicine through research and collaboration.”

“There are a lot of translational opportunities working in a clinical department,” Klumpp says. “There is an unmet need in clinical medicine; there are interesting and important problems where patients can benefit from basic science.”
Faculty Profile: Ruchi Gupta, MD, MPH
Associate Professor of Pediatrics—Academic Pediatrics and Primary Care

Food-allergy expert Ruchi Gupta, MD, MPH, associate professor of pediatrics—academic general pediatrics and primary care, learns as much in her living room as her lab.

“My daughter is allergic to peanuts and tree nuts so I understand some of the difficulties that many parents face,” said Gupta, director of the program for maternal and child health within the Center for Healthcare Studies.

Having published a study in 2011 showing that one in 13 American children suffer from a food allergy, Gupta added to the literature this past summer when she mapped the prevalence of the issue throughout the country.

“We found for the first time that higher population density corresponds with a greater likelihood of food allergies in children,” she said. “The environment has an impact on developing these allergies. The big question now is: what in the environment is triggering them?”

Printed in Clinical Pediatrics, the paper is one of more than 30 first-authored pieces Gupta has published since starting at the medical school in 2006. In that time she has also penned editorials for numerous news organizations and wrote "The Food Allergy Experience," a book meant to inform parents, teachers, and caregivers about the impact of food allergies on all aspects of a child’s life.

With support from the National Institutes of Health, Food Allergy Initiative, the National Children’s Study, and the Robert Wood Johnson Foundation, Gupta continues to look for answers to ailments that affect millions.

“I enjoy working in the community because I get to interact directly with people affected, improving both equity and my understanding of the real world impact that disease can have on daily life,” she said. “I also really enjoy conducting research that can have an influence on policy and improve the lives of children and their families.”

Q&A

What are your research interests?

My lab is mainly focused on pediatric asthma and food allergy.

What is the ultimate goal of your work?

I would like to be able to improve the health and well-being of children and their families.

How does your research advance medical science and knowledge?

Our research on the prevalence and distribution of food allergy was the first to show that one in 13 children has a food allergy. We also reported what types of food allergy they suffered from, as well as severity. This data has helped pass policies for food allergy management in schools as well as help make progress in overall understanding.

How did you become interested in this research?

I became interested in asthma because it was the number one reason kids came into the clinic and emergency room. There was a big disparity in asthma with underserved kids having higher rates and poorly controlled asthma. I want to help empower kids to manage their asthma and know that they could still do anything they wanted.

I became interested in food allergies when I met a family with two kids suffering from them. They explained to me how difficult it was on their daily lives and how so little was known about it. I started working in the field and became very passionate about the issue and later discovered my own daughter had a food allergy. I now work in all areas of food allergy – clinical, economic, epidemiology, and quality of life.

What do you consider your defining characteristics outside of medicine?

My biggest hobby right now is my family. With work being as busy as it is I cherish my time with my husband and children. We love Chicago summers and living in the city. I also love volunteering and working with the underserved. I do this through my research and outside of work whenever I can.

How has your career changed over time?

I became interested in medicine during middle school and my interest grew throughout high school. I did not know I wanted to be a pediatrician however until my final year of medical school. I decided to go into research in my last year of residency. My career is ever evolving and that is what keeps it exciting. There are so many things you can do in the medical profession.

Who has been your biggest influence?

The biggest influence on my life is my father. He encouraged me to be a physician and taught me to care for the underserved. He instilled in me a passion to help children with difficult chronic diseases and help those less fortunate find their voice so they can learn to advocate for themselves.
Staff Profile: Amanda Morris
Publications Editor, Northwestern University Office for Research

Where are you originally from?
I grew up Macomb, which is a small town in western Illinois.

What is your educational background?
I earned my bachelor’s degree in journalism from the University of Illinois, Urbana-Champaign in 2003. Now I am just finishing up my masters in creative writing from Northwestern University, with plans to graduate in December.

Tell us about your professional background.
I started my Northwestern career as a department assistant in University Relations. That’s where I learned my way around the world of University communications.

What is your role at the University?
I am the publications editor for the Office for Research. We have a monthly newsletter (Northwestern Research Newsletter), biannual magazine (CenterPiece), and annual report that I write for and help put together. I also curate our new research website, Discover, and run the Northwestern Office for Research Facebook and Twitter pages.

Tell us about the new Discover blog – what is the purpose and how can researchers get featured in it?
Named for one of the pillars in the Northwestern strategic plan, Discover acts as a hub for research news across the entire university. We are always looking for great research stories to feature. If anyone has a news tip, they are welcome to contact me at amandamo@northwestern.edu.

What is your favorite part of the job?
I love visiting labs and various offices to see research happening at Northwestern. In my five years in the Office for Research, I’ve climbed to the roof of the Main Library to measure carbon dioxide, worn bunny suits in clean rooms, looked at brain tumor cells under a microscope, and so much more. I get access to all of the neat, behind-the-scenes science and get to learn about all different topics.

What do you like to do in your spare time?
I love spending time with my husband Mark and our cat Oliver. We often go on long walks and explore the city. (Well, Mark and I walk. The cat has to stay home.)

► Connect with Amanda on LinkedIn.

Cover Art Collection
To support a Northwestern University initiative, Feinberg's Research Office recently called for issues of journals in the life sciences between the dates of September 1, 2012 and August 30, 2013, in which the cover art featured articles written by Feinberg faculty. The office received 25 covers associated with Feinberg research. Following are examples of these journal covers.


McNally BA, Somasundaram A, Jairaman A, and Prakriya, M. The C- and N-terminal STIM1 binding sites on Orai1 are required for both trapping and gating of CRAC channels. Journal of Physiology. 2013 June 1;591: 2833-2850.
Student Q&A: Julie Yonek, MPH
Health Sciences Integrated PhD Program

Where is your hometown?
I’m from Piedmont, California.

What is your educational background?
I have a bachelor's degree in animal physiology and neuroscience from the University of California, San Diego, and a master's of public health in epidemiology and biostatistics from San Diego State University.

What are your research interests?
I’m interested in the social mechanisms behind racial/ethnic differences in health outcomes and health service utilization (e.g., the effect of social context and culture on disparities in chronic conditions and behavioral health disorders).

What exciting projects are you working on?
I am currently working on an evaluation of Aligning Forces for Quality (AF4Q), The Robert Wood Johnson Foundation’s signature effort to improve the overall quality of health care in targeted communities across the United States, including the reduction of disparities in care.
Specifically, I am examining strategies and activities implemented by participating communities to increase racial/ethnic minorities' awareness of public reports on provider quality.

What attracted you to the HSIP program?
I liked the interdisciplinary nature of the program, which provides the opportunity to collaborate with faculty from fields outside of my specific discipline (health services research and outcomes).

What has been your best experience at Feinberg?
The expertise and dedication of its faculty; the wide range of research opportunities; the collaborative environment.

How would you describe the faculty at Feinberg?
The faculty are very collaborative and invested in training students and junior-level researchers to become leaders and experts in the health sciences.

What do you do in your free time?
I enjoy trail running, yoga, and travel.

What are your plans for after graduation?
I plan to teach health disparities to university students and lead research that advances our understanding of effective approaches to reduce disparities in care and outcomes for underserved populations.

ORS Simplifies Lab Safety

More than 300 graduate students recently attended the Office of Research Safety's (ORS) “Risk, Rewards, and Ratio” sessions, held in Evanston; it was the greatest turnout for new graduate safety training in ORS history. A recent article in Northwestern University's Research Newsletter attributes this success to a renewed effort to simplify and modernize training programs for new and experienced researchers alike.

To make training easier, the Office is working to update programs by harnessing the power of social media. To date, five training videos have been posted to Northwestern’s YouTube site. The videos demonstrate the importance of safety and provide instructions for how to handle tricky situations such as chemical spills in the lab.

View the videos online and visit the Office for Research Safety for more information.

ORS technical staff participated in hazardous materials training provided by the Illinois Fire Service Institute at the University of Illinois at Urbana-Champaign. Photograph courtesy of Michael Blayney.
**Sponsored Research**

**Bruce Bochner, MD**
Professor in Medicine - Allergy and Immunology

**Project title:** Targeting Siglec-8/-F to treat eosinophil and mast cell related disorders

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

In anaphylaxis, asthma, other forms of serious allergic diseases, and even in certain gastrointestinal conditions and cancers, two types of cells, namely eosinophils and mast cells, are suspected to be prime suspects for causing disease. For allergic diseases, drugs remain incompletely effective, and there are no FDA-approved drugs for eosinophil-related gastrointestinal diseases and mast cell cancers.

Siglecs (sialic acid-binding, immunoglobulin-like lectins) are a family of cell surface proteins found predominantly on white blood cells. Siglec-8 was discovered as part of the Bochner team’s effort, initiated about a decade ago, to identify novel human eosinophil proteins. Subsequent studies also detected its expression on mast cells. The closest version of Siglec-8 in the mouse is Siglec-F, which is also selectively expressed by eosinophils but unfortunately not on mast cells. Both Siglec-8 and Siglec-F preferentially recognize two unusual sugar structures, namely 6’-sulfosialyl Lewis X and an identical structure lacking the sugar fucose. Engagement of Siglec-8/-F with antibodies and/or sugar ligands cause eosinophil death and reduce mast cell activation, and administration of Siglec-F antibodies in mouse models of asthma and eosinophil-related diseases show beneficial effects.

The goal of our studies is to employ antibodies and sugar ligands recognizing Siglec-8 in translational, preclinical in vitro and murine studies to define their utility as therapeutic targets. To accomplish this, we are making new strains of mice that have Siglec-8 on their mast cells and eosinophils, so that we can begin to test treatments that one day might be used to treat humans.

Some of our strategies may lead to better ways of using non-invasive imaging materials to identify inflammation involving these cells. Other approaches involve using nanoparticles that bind to Siglec-8 to carry specific drug payloads to see if they are capable of reducing eosinophilic inflammation and mast cell activation. Similarly, these nanoparticles loaded with chemotherapy will be tested to see if they will safely and effectively kill mast cell and eosinophil cancers. Thus, the overall goal of our project is to exploit this eosinophil and mast cell-specific cell surface protein called Siglec-8 for therapeutic benefit because it provides a selective way to target these cells and not others.

**Steven Wolinsky, MD**
Chief, Division of Medicine-Infectious Diseases and Samuel Jefferson Sackett Professor of Infectious Diseases

**Project title:** An 'omics' approach towards influenza A replication and pathogenesis

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

Influenza A virus infection of host cells initiates antiviral innate immune responses that result in the expression of numerous interferon-stimulated genes that interfere with its life cycle. The virus, however, can

Continued on pg. 7

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**NIH and HHS News**

Under the recent budget agreement, the National Institutes of Health (NIH) is operating under a continuing resolution through January 15. The agency issued a notice announcing that it will issue non-competing research grant awards at a level below that indicated on the most recent notice of award (generally up to 90 percent of the previously committed level). Upward adjustments will be considered when a final appropriations bill is enacted. This action is consistent with NIH’s previous practice while working under CRs.

NIH has published a revised version of the *NIH Grants Policy Statement,* which is applicable to all NIH grants with budget periods beginning on or after October 1, 2013.

The HHS Office of Research Integrity has posted a new responsible conduct of research casebook. The resource features cases organized on the following topics: authorship and publication, research misconduct, collaboration, data acquisition and management, conflicts of interest, peer review, mentor and trainee relationships, and social responsibility.
bring about measures that affect many components of the host innate immunity response to infection. The effects of influenza A virus on innate immunity are not only to escape detection within the cell, but also to allow the virus to use the components of immune signaling pathways for its own advantage. Variations in DNA sequence may have a significant impact on how humans respond to influenza A virus.

Large-scale genomic, proteomic and metabolomics screens will identify the human proteins that could contribute to the immune response to infection, act as cofactors important for replication, or be cellular restriction factors that have the intrinsic (or innate) ability to suppress influenza A virus infection. We will sequence parts of the human genome that code for the catalog of borrowed human proteins to ferret out rare genetic variants that confer function-altering changes to influence influenza A virus-induced host responses and disease.

A key resource for this large-scale study is the hundreds of known patients with the extreme phenotypes for influenza A virus infection, for which we will work with the physicians of Northwestern Medicine to recruit into a database and cell repository and to follow with social media tools for real-time epidemiology. As a result, we will learn how our genome affects influenza A virus disease and find potential drug targets.

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### High Impact Factor Research: September 2013


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### Help Feinberg Track Journals

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

*Boston Globe, October 28*
Facing down phobias may be the best cure
Katherina Hauner’s research was featured.

*Chicago Tribune, October 23*
Engineering a healthier you
Enid Montague was interviewed about her research.

*NBC-TV Chicago, October 22*
Groundbreaking heart device keeping patients alive
Rick McGee was quoted.

*Boston Globe, October 21*
When the baby blues are something more
Katherine Wisner’s research was featured.

*MSN Healthy Living, October 19*
Doctor’s eye contact strengthens bond with patient, study finds
Enid Montague’s research was featured.

*CBS-TV Chicago, October 18*
Brain donation key to curing degenerative diseases
Cindy Zadikoff was quoted.

*WebMD, October 16*
Immune protein found to block HIV spread in some
Richard D’Aquila’s research was featured.

*Chicago Tonight, October 14*
Advancements in Alzheimer’s research
William Klein was interviewed.

*Chicago Tribune, October 9*
Coaxing bad memories away with smell
Jay Gottfried’s research was featured.

*New York Times, October 7*
Breakthroughs in prenatal screening
Darby Morhardt’s work was featured.

*FOX News (National), October 7*
Are blood clots after surgery a sign of hospital quality?
Karl Billimoria was interviewed.

*MSN Healthy Living, October 7*
Unhealthy habits should be treated as aggressively as disease, AHA says
Bonnie Spring’s research was featured.

Welcome New Faculty

**C. Hendricks Brown, PhD, MA**, joins as professor of psychiatry and behavioral sciences. He also holds adjunct appointments in the Departments of Biostatistics and Mental Health at the Johns Hopkins Bloomberg School of Public Health and the Department of Public Health Sciences at the Miller School of Medicine at the University of Miami.

Brown was previously a professor of epidemiology and biostatistics at University of Miami Miller School of Medicine. He received his doctorate degree in statistics and master’s degree in chemistry from the University of Chicago.

He directs the National Institute on Drug Abuse-funded Center for Prevention Implementation Methodology for Drug Abuse and Sexual Risk Behavior and National Institute of Mental Health-funded study to synthesize findings from individual-level data across multiple randomized trials for adolescent depression. Recently, his work has focused on the prevention of drug abuse, conduct disorder, and depression, and particularly the prevention of suicide. Brown has been a member of the recent National Academy of Sciences/Institute of Medicine committee on prevention science, and serves on numerous federal panels, advisory boards, and editorial boards.

**Nicholas Soulakis, PhD**, joins as assistant professor of preventive medicine and biomedical informatics.

He previously was employed by the New York City Department of Health and Mental Hygiene as director, health information exchange, Primary Care Information Project, and city research scientist. Soulakis received his doctorate degree in epidemiology from the University of Pittsburgh School of Public Health and his master’s degree in epidemiology from the University of Texas School of Public Health.

Soulakis’ research focuses on leveraging clinical epidemiology, decision science, and data mining techniques to extract data from electronic health records to develop case definitions for conditions ranging from infectious to chronic diseases.

**SAVE THE DATE:**
**TENTH ANNUAL LEWIS LANDSBERG RESEARCH DAY**
**APRIL 3, 2014**
**Funding Opportunities**

**Inner City Asthma Consortium (UM1)**  
[More information](#)

**Sponsor:** United States Department of Health and Human Services, National Institutes of Health  
**Submission Deadline:** December 20  
**Upper Amount:** $10 million

**Synopsis:** The purpose is to invite applications to conduct clinical research and assume the leadership and administrative responsibilities for the Inner City Asthma Consortium (ICAC). The selected applicant will continue the mission of the ICAC, which focuses on the treatment and prevention of asthma in inner-city populations by conducting clinical trials and mechanistic studies in order to understand the immunopathogenesis of the disease and to evaluate and develop effective interventions tailored to inner-city populations.

Major research objectives of the ICAC include, but are not limited to: develop allergen immunotherapy modalities to mitigate and/or prevent the effects of inner-city specific allergens on asthma; develop and implement other innovative, phenotype-specific, immunomodulatory clinical trials for the treatment of inner-city asthma; develop and implement clinical trials to prevent the incidence or progression of inner-city asthma; and investigate the role of the microbiome of the host (GI, respiratory, skin) and the home environment in inner-city asthma.

**Support of NIGMS Program Project Grants (P01)**  
[More information](#)

**Sponsor:** United States Department of Health and Human Services, National Institute of General Medical Sciences  
**Submission Deadline:** January 27  
**Upper Amount:** $6.5 million

**Synopsis:** This funding opportunity announcement issued by the National Institute of General Medical Sciences encourages innovative, interactive Program Project grant applications from institutions or organizations that propose to conduct research which aims to solve a significant biological problem, important for the mission of NIGMS, through a collaborative approach involving outstanding scientists. The Program Project grant is designed to support research in which the funding of several interdependent projects as a group offers significant scientific advantages over support of these same projects as individual regular research grants.

**View more funding opportunities**

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**Featured Events**

**11.13**  
18th Annual Drug Discovery Symposium  
The symposium involves poster presentations by researchers working on drug discovery projects across a range of disease areas and features a keynote address by Stephen Frye, PhD, University of North Carolina (formerly of GlaxoSmithKlein).  
**Date:** Wednesday, November 13, 2 to 5 p.m.  
**Location:** Lurie Research Center — Hughes 303 E. Superior St. (Chicago campus)

**Contact:** [hannah.meiser@northwestern.edu](mailto:hannah.meiser@northwestern.edu)  
[More information](#)

**11.14**  
Feinberg Cardiovascular Research Institute Seminar  
Presented by Tracey A. Rouault, MD, Section on Human Iron Metabolism, NICHD.  
**Date:** Thursday, November 14, 8:30 to 9:30 a.m.  
**Location:** Wieboldt Hall, Room 408 339 E. Chicago Ave. (Chicago campus)

**Contact:** k-lebeau@northwestern.edu  
[More information](#)

**11.19**  
Microbiology-Immunology Seminars  
“Contribution of merkel cell polyomavirus to merkel cell carcinoma,” presented by James DeCaprio, MD, Dana Farber Cancer Institute.  
**Date:** Tuesday, November 19, Noon to 1 p.m.  
**Location:** Lurie Research Center — Baldwin 303 E. Superior St. (Chicago campus)

**Contact:** b-thimmapaya@northwestern.edu  
[More information](#)

**11.20**  
Silverstein Lecture Series  
“Genetics of circadian rhythms and sleep: Modern life battles ancient drives and mother nature,” presented by Fred Turek, PhD, Northwestern University.  
**Date:** Wednesday, November 20, 6 to 7 p.m.  
**Location:** Lurie Research Center — Hughes 303 E. Superior St. (Chicago campus)

**Contact:** michelle.mohney@northwestern.edu  
[More information](#)

**11.21**  
Lurie Cancer Center Tumor Cell Biology Seminar  
“Tumor suppression via oncoprotein destruction: Just another day's work for ubiquitin ligase,” presented by Bruce Clurman, MD, PhD, University of Washington.  
**Date:** Thursday, November 21, 1 to 2 p.m.  
**Location:** Lurie Research Center — Searle 303 E. Superior St. (Chicago campus)

**Contact:** cancer@northwestern.edu  
[More information](#)

**More events**

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