Interventional Oncology Group Translates Cutting-Edge Research to Cancer Patients

Working closely with colleagues in medical, surgical, and radiation oncology, a group of passionate researchers and clinicians are rapidly advancing a fairly new subspecialty in oncology pioneered at Northwestern University Feinberg School of Medicine. Termed “interventional oncology” (IO), this approach to treating cancers uses minimally invasive, image-guided techniques that provide a local tumor response with few side effects.

“Interventional oncology is the fourth arm of oncology; at Feinberg, it exists on a multidisciplinary platform, with numerous specialists teaming up to determine the very best treatment algorithm for each patient,” says Riad Salem, MD, MBA, professor of radiology, medicine, and surgery, and chief of the Division of Interventional Oncology. “This dynamic subspecialty is rapidly evolving, and ultimately results in more targeted, less invasive therapies.”

Considering the number of clinical trials, patients, trainees, as well as published research and funding, it is clear that Salem and his colleagues have developed the world’s largest IO program. They also serve as leading authorities on many IO techniques, including chemoembolization and radioembolization, which involve catheter-based injections of chemotherapy-loaded or radioactive tiny beads directly into the blood supply of tumors.

Continued on pg. 2
“In the liver, for example, treatment options are limited; but physicians here can target these tumors selectively,” says Liz Gonda, RN, BSN, clinical research nurse and program coordinator for the lab of Reed Omary, MD, MS, professor and vice chair for research in the Department of Radiology.

The main focus of the IO team, led in partnership by Salem and Omary, remains on liver therapies, which treat a patient population that may not be served well by traditional methods like chemotherapy or surgery. The team also has an interest in other abdominal malignancies such as metastatic colorectal cancer and neuroendocrine tumors; therefore, they have built strong relationships with colleagues in gastrointestinal oncology — interacting daily to discuss care plans, clinical trials, and grant opportunities. Some patients with kidney, metastatic breast, or lung cancers may also be candidates for IO therapies.

“The inherently disruptive, forward-thinking nature of IO toward conventional treatment paradigms has placed us at the center of numerous multi-disciplinary collaborations. We have forged successful partnerships across Northwestern University campuses by incorporating the drug delivery benefits of nanotechnology. Additionally, we have directly promoted clinical growth by closely interacting with our esteemed colleagues in oncology, hepatology, and transplant surgery,” says Omary.

Top-Tier Research

No doubt, the clinical and basic science research happening within the IO group involves numerous specialists who collaborate seamlessly to ensure the best possible outcomes. Salem and Mary Mulcahy, MD, associate professor of hematology/oncology, radiology, and surgery, each serve as principal investigators on international, multi-center randomized Phase III clinical trials. Mulcahy’s main research interest is colon cancer; Salem’s focus is treating hepatocellular carcinoma, the most common type of liver cancer.

“These two landmark clinical trials have the potential to significantly impact the clinical standards of care for patients with hepatocellular carcinoma and metastatic colorectal cancer to the liver,” says Salem.

Similarly, Omary’s work as a physician-scientist straddles translational and basic science research. He and Andrew Larson, PhD, associate professor of radiology, are leading research supported by four separate National Institutes of Health (NIH)-funded R01 grants. Their pre-clinical and clinical studies involve local, image-guided delivery of therapeutics for cancers of the liver and pancreas.

“Our discoveries in the lab are translated to patients at Northwestern. We also take clinical questions about current therapies back to the lab to test new hypotheses,” says Omary. “Thus, our translational research circles from bench-to-bedside and back to the bench.”

Seeking New Opportunities

Moving forward, the IO group plans to continue their progress by developing the next generation of image-guided therapies employing novel imaging modalities, therapeutic entities, and delivery devices. A future goal also involves a collaboration with the NIH to treat patients with inoperable pancreatic cancer.

“Our goal is to propel IO forward in order to further benefit patients with cancers of the abdomen,” says Salem.

Honoring Excellence

The groundbreaking work happening among the IO group has recently been recognized on the national level. Earlier this year, the team earned numerous research accolades at the Society of Interventional Radiology Awards. Additionally, this past summer, Omary and Ann Ragin, PhD, research professor of radiology, began serving on NIH study sections — in prestigious positions that have them reviewing and providing feedback on grant applications from peer institutions.

Says Gonda: “Our recent recognition confirms our position as leaders in the field and motivates us to make additional discoveries that may help patients across the world.”

For more information about the Northwestern Interventional Oncology group, contact Liz Gonda: e-gonda@northwestern.edu or (312) 926-5750.
Steven Kosak, PhD, assistant professor in the Department of Cell and Molecular Biology at Northwestern University Feinberg School of Medicine, was recently named a recipient of the National Institutes of Health (NIH) New Innovator Award – an innovative research program that offers funding to high-impact researchers with an interest in risk-taking innovation.

“I am honored to have received such an important award, as it allows me to perform the research about which I’m most passionate,” says Kosak, who studies how the human genome is dynamically reorganized during the differentiation of stem cells to derived cell types. “I also feel validation for our ideas that are both new and somewhat controversial. The New Innovator Award is truly a career inspiration.”

The award, supported by the Director’s Award Program through the NIH Common Fund, is part of a $143.8 million effort to challenge the status quo with creative ideas that have the potential to propel fields forward and speed the translation of research into improved health for the American public.

“The NIH Director’s Award programs reinvigorate the biomedical workforce by providing unique opportunities to conduct research that is neither incremental nor conventional,” says James M. Anderson, MD, PhD, director of the Division of Program Coordination, Planning and Strategic Initiatives, who guides the Common Fund’s High-Risk Research program. “The awards are intended to catalyze giant leaps forward for any area of biomedical research, allowing investigators to go in entirely new directions.”

Funding from the NIH New Innovator Award will allow Kosak, also a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, to test the hypothesis that the human genome is re-organized within the nuclei of stem cells during cellular differentiation due to the overall effect of coordinate gene expression. In addition, he will attempt to determine if this process is an example of a self-organizing system, in which the emergence of a structure (or behavior) both results from and subsequently supports a network of functional interactions.

“We are developing new experimental techniques and mathematical approaches to perform this work,” says Kosak. “We anticipate that knowing the specific genomic topologies during normal cellular differentiation and in disease states will provide the basis for new diagnostic tools and therapeutic modalities.”

Since inception, the NIH Director’s Award Program has funded a total of 406 High-Risk Research awards: 111 Pioneer Awards since 2004, 216 New Innovator Awards since 2007, and 79 Transformative Research Projects Awards since 2009. This tally includes this year’s 13 Pioneer Awards, 49 New Innovator Awards, and 17 Transformative Research Projects Awards. Click here for more information on the New Innovator Award, including information on this year’s awardees.

NIH News

- NIH released “Revised Policy: Managing Conflict of Interest (COI) in the Initial Peer Review of NIH Grant and Cooperative Agreement Applications.” This announcement provides revised policy for managing COI, prejudice, bias, or predisposition in the NIH initial peer review process. Given the increasingly multi-disciplinary and collaborative nature of biomedical and behavioral research, the revised policy is intended to facilitate reviews that involve multi-site or multi-component projects, consortia, networks, aggregate datasets, and/or multi-authored publications.

- The NIH Advisory Committee to the Director’s NCATS Working Group has posted its report. The group said that the proposed National Center for Advancing Translational Sciences (NCATS) is ideally suited to catalyze translation by promoting innovative research, galvanizing and supporting new partnerships, supporting and augmenting the discipline of regulatory science and its application, expanding the precompetitive space by promoting information exchange and encouraging the dissemination of research outcomes, harnessing the power of the CTSA program, and transforming through training.
Ackermann Named Director of NUCATS Community-Engaged Research Center

The Northwestern University Clinical and Translational Sciences (NUCATS) Institute, the Department of Medicine, and the Division of General Internal Medicine are pleased to announce that Ronald Ackermann, MD, MPH, FACP, has been named the next director of the NUCATS Community-Engaged Research Center (CERC).

Ackermann is a general internist with advanced training in epidemiology, public health, and health services research from the University of Washington School of Public Health in Seattle. He is currently associate professor of medicine at the Indiana University School of Medicine and director of the Indiana Clinical and Translational Sciences Institute’s Community Health Engagement Program. He is a national expert in healthcare-community partnerships designed to address unhealthy lifestyle behaviors and improve the prevention and control of common chronic illnesses such as asthma, congestive heart failure, and diabetes. He has served as a lead evaluation consultant for Agency for Healthcare Research and Quality (AHRQ), the Lewin Group, and the Center for Health Care Strategies in a series of learning initiatives designed to improve the implementation and evaluation of disease and care management programs in 20 U.S. states.

Ackermann is also the principal architect and director of a large ongoing research program at Indiana University School of Medicine to evaluate the feasibility, costs, and effectiveness of partnered approaches for preventing and managing diabetes and other chronic health conditions. In addition to these activities, he has served as an expert advisor for other large initiatives sponsored by AHRQ, the Center for Disease Control and Prevention, the National Institutes of Health, the National Committee for Quality Assurance, and the American Diabetes Association.

Kibbe Appointed IBNAM Deputy Director

Melina Kibbe, MD, Edward G. Elcock Professor of Surgical Research and associate professor of surgery in the Division of Vascular Surgery, will serve as the first deputy director of the Institute for BioNanotechnology in Medicine (IBNAM). Kibbe has been a resident member of the Institute since 2006 and has spawned many important research collaborations with other IBNAM members.

Stupp, Board of Trustees Professor of Materials Science, Chemistry, and Medicine, on strategic initiatives that will influence the institute’s future development. In particular, she will help develop new programs designed to foster connections between Feinberg faculty, key collaborators at IBNAM, and other faculty based on the Evanston campus.

Stupp and Kibbe have already begun work on one such project. “Melina has been very active in helping me organize a major new grant proposal from IBNAM investigators in the area of targeted cardiovascular therapies based on nanotechnology,” said Stupp. “Her own research program is currently thriving with recognition, funding, and promotions, and I am excited to work with her in the capacity of deputy director.”

Expanding the IBNAM leadership team by hiring a deputy director was listed as a top priority during IBNAM’s recent program review. The institute’s faculty and advisory board members embraced this recommendation, seeing an opportunity to further strengthen the vital and successful institute and take it into the future with new accomplishments, intellectual evolution, and growth. Kibbe’s experience as a practicing surgeon and her grounding in medical research complement Stupp’s expertise in developing innovative technologies for medical application.

On receiving the news of Kibbe’s nomination to this post IBNAM advisory board member Douglas Losordo, MD, Eileen M. Foell Professor of Heart Research, professor of cardiology, and director of the Feinberg Cardiovascular Research Institute remarked, “I think this is a terrific idea, and Melina is the perfect candidate to fulfill this role. She is, in my opinion, one of the most outstanding physician scientists in the country right now, highly visible as a vascular surgeon who is innovating in novel and clinically important areas. She will be an asset.”
Marc Slutzky, MD, PhD, assistant professor in the Ken and Ruth Davee Department of Neurology/Physiology and Physical Medicine and Rehabilitation, recently received the Doris Duke Clinical Scientist Development Award, which provides support for outstanding physician-scientists in the process of establishing their own independent research teams.

Slutzky, a Morton Grove, Ill., native, completed his residency in neurology at Feinberg and became a faculty member in 2006. He earned a doctorate degree in biomedical engineering in 2000 and a Doctor of Medicine degree in 2002 from Northwestern as part of the Medical Scientist Training Program. He received a bachelor’s degree in electrical engineering from the University of Illinois at Urbana-Champaign (UIUC) in 1994.

What does the Doris Duke Clinical Scientist Development Award recognize?

The award provides additional protected time for clinical research. The selection process has two stages: first at the university level (only two nominees per school), and then 16 out of those 130 university nominees were chosen.

My project for this award aims to create a minimally-invasive brain-machine interface (BMI) using subdural and epidural signals from epilepsy patients who require intracranial placement of electrodes prior to epilepsy surgery. The subjects will attempt to control a virtual hand using a BMI that decodes both their own hand movements and observed hand movements. Since paralyzed patients will not be able to make example movements, the ability to use observed movements to train the BMI “decoder” would be advantageous for an eventual application.

Tell us more about your research interests.

My research consists of several thrusts in the field of neural prosthetics. My main focus is on BMIs, which record and “decode” brain signals and allow a user to control a device, such as a computer cursor or prosthetic arm, simply by thinking of the desired movement. This could benefit patients with a wide range of neurological disorders, especially those with severe paralysis. A critical question in BMI research is how best to obtain signals from the brain. Most BMIs have used electrical signals obtained at levels ranging from the scalp (EEG) to individual neuronal action potentials (spikes) inside the cerebral cortex. In general, there is a trade-off between the level of invasiveness and signal quality and recording longevity.

Another of my interests lies in determining the optimal signal source for a desired BMI application. Specifically, while intracortical spikes are thought to carry the most information about movement intent, it is difficult to record spikes from many electrodes for more than a few years. Therefore, we are interested in whether field potentials, which are derived from thousands of neurons, can provide enough information to provide good control of a BMI without sacrificing longevity. Moreover, we are investigating whether field potentials obtained in a less-invasive way—i.e., from electrodes placed under or on top of the dura mater—can also provide a high-quality signal source for BMI applications such as robotic arm control. We are investigating this question in rats, monkeys, and humans.

My other main research thrust involves a myoelectric computer interface (MCI), in which a person controls a computer cursor using electrical signals recorded from muscles (surface EMGs) instead of the brain. Each muscle moves the cursor in a different direction; by varying the mapping of muscle to direction, we can train the subject to learn new patterns of muscle activation. This provides a new platform for studying motor learning. Moreover, we aim to apply this technology to stroke rehabilitation. In addition to weakness, co-contraction causes major impairment in stroke subjects. Abnormal co-contraction consists of increased tone in muscles (e.g., agonist-antagonist pairs) during attempted movement by the patient. By using the MCI, we hope to reduce co-contraction and thus improve arm function.

How did you become interested in this area of research?

As an undergraduate at UIUC, I worked with Bruce Wheeler for an honors thesis project on decoding some of the data for one of the first BMIs, based on P300 waves recorded from the scalp. While this project was ultimately unsuccessful, it opened my mind to the BMI field. My graduate work aspired toward refining another form of brain machine interfacing—control of epileptic seizures using precisely timed electrical stimulation at the seizure focus. Later, I
read about the work of Lee Miller, PhD, in BMIs and decided to switch my focus from epilepsy to motor BMIs.

What is the ultimate goal of your research?

The ultimate goal is to restore function to patients paralyzed or weakened from disorders such as stroke, spinal cord injury, and ALS.

BMIs offer the possibility of doing this directly by controlling the functional electrical stimulation of paralyzed muscles in a natural fashion (i.e., think about closing the hand, and the hand closes). They also offer the possibility of pairing brain and muscle activity to potentially increase the brain’s plasticity and help recover motor function after a stroke.

The goal of our MCI research is twofold: to help restore function to patients with motor impairment, and to uncover mechanisms of neural interface learning that may inform our BMI research.

How does your research advance medical science and knowledge?

Neural interfaces offer the exciting potential to restore function to paralyzed patients who currently have very little options. While the field of BMIs has exploded with rapid growth in laboratories, it is still very much in its infancy. Our research aims to elucidate ways to obtain high-quality, long-lasting signals for BMIs while minimizing potential adverse effects. Our work thus far demonstrates that epidural signals may provide similar information to subdural signals, and that intracortical field potentials convey almost as much information as spikes.

Subdural electrode monitoring allows us to record from multiple brain areas simultaneously with high temporal resolution. However, most electrode arrays used in clinical epilepsy monitoring have coarse spatial resolution. Our work suggests that we could obtain much more information simply by increasing the density of the electrodes used. This could improve not only BMIs, but also our understanding of human physiology and pathophysiology.

BMIs also provide a uniquely powerful platform to study brain physiology. For example, monkeys learn to control a cursor using decoded signals from motor cortex that are highly correlated with arm movements, yet they learn to move the cursor without moving their arms. I am very interested in the mechanism for phenomena like this, and what it can teach us about normal and abnormal brain physiology. MCIs likewise provide a new paradigm for studying adaptation to neural interfaces.

What collaborations are you involved with across campus and beyond?

I am fortunate to be involved with several different collaborations. I work very closely with Lee Miller, PhD, in the Department of Physiology, and through him I am involved in collaborations with several other faculty including Sara Solla, PhD, and Konrad Kording, PhD, also from the Department of Physiology; Nicholas Hatsopoulos, PhD, at the University of Chicago, and Andrew Fagg, PhD, at the University of Oklahoma.

My desire to advance my BMI research into human subjects led me to collaborate with Joshua Rosenow, MD, director of functional neurosurgery at Northwestern Memorial Hospital, and Stephan Schuele, MD, director of the Clinical Epilepsy Center at NMH. This collaboration further involves Jun Yao, PhD, and Julius Dewald, DPT, PhD, Department of Physical Therapy. Together we have recorded from five epilepsy subjects while they perform hand grasping movements.

I also collaborate with the laboratory of Jim Patton, PhD, to examine decoding speech from human brain surface signals. To broaden our patient recruitment efforts, I have established a collaborative agreement to perform similar experiments with James Tao, MD, and David Frim, MD, Departments of Neurology and Neurosurgery, respectively, at the University of Chicago Medical Center.

The Doris Duke project includes a collaboration with and mentorship from Todd Kuiken, MD, PhD, director, Neural Engineering Center for Artificial Limbs at the Rehabilitation Institute of Chicago (RIC), as well as a collaboration with Gerwin Schalk, PhD, Wadsworth Center at Albany Medical College.

Zev Rymer, MD, PhD, vice president for research, RIC, has been my co-mentor on my K08 award, and is a co-investigator on my MCI research project.

Finally, I am a co-PI in a multi-institutional DARPA project to design reliable CNS BMIs with investigators at Northwestern, University of Chicago, University of Oklahoma, and Michigan State University. This project aspires to have monkeys control a robotic arm and hand using a BMI.

How is your research funded?

My main source of funding has been an NIH K08 award for the past four years. I have also received funding from several private foundations, including the Brain Research Foundation and Northwestern Memorial Foundation Dixon Translational research awards that helped start my independent research in humans. More recently I have been awarded funding for my human BMI work from the Paralyzed Veterans of America and the Doris Duke Charitable Foundation. I also received a Neilsen Foundation Research Grant for the human BMI work which I had to decline due to overlap with the Duke award.
Where is your hometown?
I was born in Chicago, but grew up in Pinckney, Mich., a small town just outside of Ann Arbor.

What is your educational background?
I received my bachelor’s degree from Eastern Michigan University in 2004. While there, I worked four years as a student intern in a cardiovascular lab at Pfizer. After graduation, I accepted a research associate position at Children’s Memorial Hospital, where I worked until 2007, when I started the IGP at Northwestern.

What are your research interests?
My primary research interests lie at the crossroads of neurodegenerative disorders, drug discovery, and developmental biology. These fields do not often intersect; however, I believe that the integration of ideas and concepts that cross disciplines will be the key to the next generation of effective therapeutics. With better understanding of the events that precede the devastating symptoms that define neurodegenerative disorders, we will be able to diagnose them earlier and hopefully intervene before the neurons become irreversibly damaged. The goal of my research is to improve patient health. By incorporating ideas and concepts learned from basic science with the wealth of clinical data that exists, I believe this to be a very achievable goal.

What projects are you working on?
My thesis project focuses on a devastating pediatric neuromuscular disorder known as Spinal Muscular Atrophy (SMA). SMA is the world’s leading genetic cause of infant mortality, for which there is no treatment or cure. We know that symptoms in SMA result from low levels of the Survival Motor Neuron (SMN) protein. For this reason, almost all prospective therapies have been designed to increase SMN dosage; however, where and when SMN needs to be rescued remains largely enigmatic.

The goal of my work has been to define the temporal and spatial requirements of the SMN protein in SMA model mice. To accomplish this, I have generated three novel mouse models of SMA, all with the ability to “rescue” SMN expression at progressive points in disease and in specific cell types. The end result will be a better understanding of how disease progression alters the effectiveness of SMN restorative therapies.

Additionally, cell type specific rescue experiments will shed light on the currently unknown mechanism that causes SMA's neuromuscular degeneration. It is my hope that this work will result in increased efficiency of pre-clinical studies by defining the cell types that need to be targeted to manage SMA and how advancing disease will affect the outcome of treatment.

What has been your best experience at Feinberg?
My best experience was the time I spent on the drug discovery T32 training grant, “Drug Discovery Training in Age Related Disorders.” The interactions with fellow trainees, faculty, and invited speakers taught me a wealth of information and exposed me to cutting-edge research that made me a better scientist.

What are your plans for after graduation?
After graduation I plan to continue on my career path, with the hopes of one day becoming the head of a laboratory that focuses on translational research and above all, having fun while doing it.

Connect with Rocco on LinkedIn.

IGP News
The IGP would like to congratulate the following students who have been awarded individual National Research Service Awards in support of their ongoing PhD dissertation work by the National Institutes of Health:

- **Ann Carias**, Department of Cell and Molecular Biology (Tom Hope, advisor)
- **Stephanie Rangel**, Department of Microbiology-Immunology (Al Hauser, advisor)
- **Natalie Remis**, Department of Anesthesiology (Jaime Garcia-Anoveros, advisor)
- **Margaret Walker**, Department of Microbiology-Immunology (Melissa Brown, advisor)
Sponsored Research

Bayar Thimmapaya, PhD
Professor in Microbiology-Immunology

Project title: “E1A Oncoprotein Induced Deregulation of Replication Origin Firing”

Sponsor: National Institute of Allergy and Infectious Diseases

The focus of our studies is to understand the mechanisms by which DNA tumor virus oncogenes perturb cellular growth control pathways and how such perturbations lead to cell transformation.

Studies of viral oncogenes such as adenovirus E1A and simian virus 40 have led to the discovery of tumor suppressor proteins including retinoblastoma family proteins pRb, p130 and p107, p53 and transcriptional coactivators p300 CBP. These proteins are key regulators of cell cycle progression. When E1A is expressed in quiescent cells, it binds to and inactivates several host proteins including Rb family members and p300/CBP, and forces cells to enter S phase in the absence of growth stimulation.

For the past several years we have been studying the consequences of E1A binding to p300 in the induction of DNA synthesis in growth arrested cells. Although p300 is known for transcriptional activation functions, we discovered that in quiescent cells, it keeps c-Myc in a repressed state and thus prevents inappropriate entry of cells into S phase. We identified a tripartite protein complex consisting of transcription factor p300, YY1, and a histone deacetylase that is responsible for repression. E1A, by binding to p300, dissociates this complex and induces c-Myc which contributes to the induction of a number of cellular proteins including a member of E2F family proteins and several proteins involved in initiation of DNA replication and cell cycle progression.

The induction of these proteins contributes to the deregulation of DNA replication. The E1A expressing cells do not cycle normally but are held in late S phase with cellular DNA undergoing extensive re-replication. When Myc expression is blocked, the aberrant DNA replication is prevented. Eventually these cells undergo apoptosis. All of these properties of deregulated replication by a viral oncogene mirror the type of replicative stress that a cell undergoes when a cellular oncogene is overexpressed.

Recent studies indicate that the DNA replicative stress is an initial step in tumorigenesis. We are interested in determining the factors that contribute to the DNA re-replication in E1A expressing cells, how E1A modifies the replication licensing proteins to induce re-replication, and whether there are any replication origins that are preferentially re-replicated. We hope that these studies will provide new insights into the molecular mechanisms by which viral and cellular oncogenes lead to replicative stress and how the replicative stress contributes to oncogenic cell transformation.

Richard Longnecker, PhD
Dan and Bertha Spear Research Professor, Professor in Microbiology-Immunology

Project title: “Role of Host Cell Factors in Herpes Simplex Virus (HSV) Keratitis”

Sponsor: National Eye Institute

Herpes Simplex Virus type 1 (HSV-1) is a nearly ubiquitous virus, infecting greater than 50 percent of the adult population. Unlike most viruses, HSV establishes latent infection that is maintained for the lifetime of the individual. The virus can periodically reactivate, causing mild disease typically associated with HSV-1 such as cold sores, but HSV can also cause severe complications if it spreads to the brain or the eye. In fact, HSV-1 is the leading cause of infectious blindness in the United States.

Andrew Karaba, an MD/PhD student, Sarah Kopp, a research technician, and professor Richard Longnecker, PhD, are trying to understand how HSV-1 uses host receptors to infect the eye and cause disease which can ultimately result in blindness. Previous research identified two host receptors, Herpesvirus Entry Mediator (HVEM) and nectin-1 as potential entry points for the closely related virus HSV-2 in genital and cranial infections. HSV-2 infections are most often confined to the genital region whereas HSV-1 is typically found in the head. Those studies

Continued on pg. 9

Sarah Kopp (L), Andrew Karaba, and Richard Longnecker, PhD
Sponsored, continued from pg. 8

on HSV-2, using knockout mice, demonstrated that HSV-2 can use nectin-1 in the absence of HVEM, but in the absence of nectin-1 the infection is attenuated.

Professor Longnecker, Andrew, and Sarah have investigated the importance of HVEM and nectin-1 in HSV-1 infection of the eye. Using a knockout mouse approach, they discovered that HSV-1 has different receptor requirements for infecting the eye than HSV-2 has for infecting the genital tract. HSV-1 ocular infection is attenuated in the absence of either HVEM or nectin-1. These findings suggest that HSV-1 depends on the presence of both receptors to cause disease in the cornea, whereas HSV-2 relies predominantly on the presence of nectin-1 to cause disease. This work was presented at the International Herpes Workshop in Gdansk, Poland in July of 2011 and recently published in the October issue of the *Journal of Virology*.

The next step is to explore why HSV-1 and HSV-2 have different host receptor requirements. Hopefully, these studies will lead to a greater understanding of how HSV infection begins and how we can develop therapeutics to prevent this costly and painful disease.

Welcome New Faculty

Mark Huffman, MD, MPH, joins as assistant professor in preventive medicine and medicine-cardiology.

Huffman previously was an NIH T32 Research Fellow in the Department of Preventive Medicine, studying global cardiovascular epidemiology, prevention, and outcomes. Prior, he served as a NIH Fogarty International Clinical Research Fellow for the Centres for Chronic Disease Control. He received his Doctor of Medicine degree and master’s degree in public health from Tulane University, and completed his graduate medical education in internal medicine at University of Michigan Health System and in cardiology at Northwestern.

Huffman has published more than 20 research and review articles. His research interests include acute coronary syndrome outcomes research and quality improvement in Kerala, India, with D. Prabahakaran (Centre for Chronic Disease Control) and P.P. Mohanan (Cardiological Society of India, Westfort Hi-Tech Hospital); estimating future trends in cardiovascular health in the U.S. using data from the National Health and Nutrition Examination Survey with D. Lloyd-Jones and H. Ning (Feinberg Preventive Medicine), E. Ford (Centers for Disease Control and Prevention), C. Shay (Oklahoma University, former Northwestern fellow), and S. Capewell (University of Liverpool); comparing primordial, primary, and secondary prevention options using a health policy modeling tool developed by Capewell; and global heart failure epidemiology and prevention.

Matthew Maas, MD, joins as assistant professor in the Ken and Ruth Davee Department of Neurology.

He previously was a research fellow in neurology at Harvard Medical School, and a clinical fellow in neurocritical care at Massachusetts General Hospital and Brigham and Women’s Hospital. Prior, he was chief resident in neurology at New York Presbyterian Hospital. He received his Doctor of Medicine degree from University of Washington and completed the program in clinical effectiveness from Harvard’s School of Public Health.

Maas’ research has focused on the emergent evaluation and management of patients with stroke. He has served as a local co-investigator on ten NIH funded projects and several industry funded studies, and is first author or co-author on eight papers in peer-reviewed journals.

Core Fact

Did you know that Northwestern University now has a Proteomics Core?

Protein identification (including proteolytic digestion and analysis) is only $130/sample.

For more information contact Dhaval M. Nanavati (d-nanavati@northwestern.edu).
Research in the News

Chicago Tribune  September 21
Northwestern Professor Enlists Cervical Mucus in HIV Fight
Dr. Thomas Hope’s research was featured.

Chicago Tribune  September 21
Younger Onset Alzheimer’s Patients Stay Active
Dr. Diana Kerwin was quoted.

Voice of America  September 19
Common Link Found in All Forms of Lou Gehrig’s Disease
Dr. Teepu Siddique’s research was featured.

The New York Times  September 16
ABC News (National)  September 15
Robertson Stirs Passions With Suggestion to Divorce an Alzheimer’s Patient
Dr. Sandra Weintraub was quoted.

USA Today  September 8
Peyton Manning’s Surgery: Study Offers Optimism
Dr. Wellington Hsu’s research was featured.

US News & World Report  September 8
Black Children May Be More Prone to Peanut Allergy, Study Finds
Dr. Rajesh Kumar’s research was featured.

UPI  September 7
Bouncer Protein has Arthritis Role
Dr. Harris Perlman’s research was featured.

CBS Morning News  September 1
Hidden Vegetables in Kid-friendly Food Products
Linda Van Horn was quoted.

More headlines

High Impact Factor Research August 2011


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.”
Funding Opportunities

**Translational Scholar Career Awards in Pharmacogenomics and Personalized Medicine (K23) - PA-11-009**

**More information**

**Sponsors:** Department of Health and Human Services (HHS), National Institutes of Health (NIH), National Cancer Institute (NCI)

**Submission Deadline:** November 12

**Upper Amount:** $1 million

**Synopsis:** The purpose of this Mentored Patient-Oriented Research Career Development Award (K23) is to provide salary and protected time to support the career development of investigators who have made a commitment to focus their research endeavors on patient-oriented research. Each Research Career Development Award must be tailored to meet the individual needs of the candidate. The Translational Scholar Awards in Pharmacogenomics and Personalized Medicine program is intended to address the scarcity of investigators cross-trained in both clinical research core competencies and modern methods required to address pharmacogenomics research problems in patient populations. Dual mentors from the Clinical and Translational Science Awards consortium and the Pharmacogenomics Research Network are required.

**Advancing HIV Prevention through Transformative Behavioral and Social Science Research (RO1)**

**More information**

**Sponsor:** United States Department of Health and Human Services (HHS), National Institutes of Health (NIH)

**Submission Deadline:** December 6

**Upper Amount:** $2.5 million

**Synopsis:** This opportunity encourages applications that will advance generalizable knowledge about HIV prevention through transformative behavioral and social science research. An underlying assumption is that methods of and findings from social and behavioral studies can make essential contributions to research that utilizes biomedical modalities. Also, biomedical perspectives are essential for advancement of social and behavioral HIV research on HIV prevention. This opportunity thus invites studies that are comprehensive in the sense that the reciprocal influences of relevant variables, whether social, behavioral, or biomedical are included in study design and interpretation. It is intended to address the goals of the national HIV/AIDS strategy, and therefore studies should address issues that are highly relevant to the domestic (i.e., U.S.) HIV problem.

View more funding opportunities

---

**Featured Events**

**10/13**

**Endocrinology Seminars**

“Transplantation osteoporosis” presented by Elizabeth Shane, MD, Columbia University Medical Center

**Date:** Thursday, October 13, 4 to 5 p.m.

**Location:** Lurie Medical Research Center – Baldwin 303 E. Superior St. (Chicago campus)

**Contact:** m-michaels@northwestern.edu

**More information**

**10/18**

**Microbiology-Immunology Seminar Series**

“When autophagy meet microbes,” presented by Jae Jung, PhD, University of Southern California

**Date:** Tuesday, October 18, Noon to 1 p.m.

**Location:** Lurie Medical Research Center – Baldwin 303 E. Superior St. (Chicago campus)

**Contact:** e-gottwein@northwestern.edu

**More information**

**10/18**

**Cell and Molecular Biology Seminars**

“Mesenchymal cell differentiation and potentiation of bone repair” presented by Gary Balian, PhD, University of Virginia School of Medicine

**Date:** Tuesday, October 18, 4 to 5 p.m.

**Location:** Ward Building, 4-075

303 E. Chicago Ave. (Chicago campus)

**Contact:** b-jaron@northwestern.edu

**More information**

**10/20**

**John and Gwen Smart Symposium (Poster Session)**

Showcasing research and education relevant to aging, terminally ill, and other vulnerable populations

**Date:** Thursday, October 20, 5 to 6 p.m.

**Location:** Prentice Women’s Hospital, 250 E. Superior St., Canning Auditorium, 3rd Floor (Chicago campus)

**Contact:** v-roman@northwestern.edu

**More information**

**10/28**

**Physiology Seminars**

“Splicing, G protein modulation, and calcium ion channels,” presented by Diane Lipscombe, PhD, Brown University

**Date:** Friday, October 28, Noon to 1 p.m.

**Location:** Ward Building, 5-230

303 E. Chicago Ave. (Chicago campus)

**Contact:** kirsten-byers@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.