Bringing Medical Technologies to the Market with NUvention

Northwestern University offers inventor hopefuls a unique two-quarter experiential course, NUvention: Medical Innovation, which joins graduate students from the Chicago and Evanston campuses to collaborate on the creation of new medical technologies.

The University’s most interdisciplinary student program, NUvention: Medical Innovation involves seven teams of three fourth-year students from Feinberg, as well as two students from each of the following schools: the Kellogg School of Management, Robert R. McCormick School of Engineering and Applied Science, and the School of Law. Teams split their time between campuses, meeting formally on Wednesday evenings to cover topics vital to the process of medical innovation.

“NUvention promotes innovation and collaboration across Northwestern and beyond,” says Dave Johnson, PhD, associate dean of research operations at Feinberg and co-director of the program. “Students who take this course are entrepreneurial problem-solvers who want to use their varied skill sets to impact human health.”

To kick off the course each September, Johnson helps teams choose specialty areas such as dermatology or cardiology. Groups shadow Northwestern faculty, residents, and nurses in their area of focus for one month to gain a 360 degree view of clinical operations and brainstorm a list of unmet medical needs. Students research the competitive market, production feasibility, and patent

Continued on pg. 2
Fourth-year Feinberg students Dela Amoussou and Sam Haywood are members of the current class, and launched the company Neuvel last fall. Amoussou, Haywood, and their colleagues came up with 59 neurology-related ideas before moving forward with an ultrasound-guided needle that helps physicians more easily perform lumbar punctures and administer epidurals during labor and delivery.

“Data collection, including the review of prior research and knowledge in the field — what innovations were attempted but failed — was a crucial part of the process,” says Amoussou, whose biomedical engineering background piqued his interest in the course.

Team Neuvel found that they could be the first player in the market with their invention — a stellar business advantage. Since the legal landscape would be fairly easy to navigate, the team together determined the specifications of the device before the engineers took over its manufacture.

“Each member of our team saw problems from a different lens. Non-medical students would ask Dela and me questions about why things were done a particular way,” says Haywood. “We started to realize that often our best answer was simply, ‘That’s just how they do it.’ Having that fresh perspective in the operating room brought forth many novel solutions.”

Along the way, Team Neuvel and others share their ideas with key opinion leaders like Patrick McCarthy, MD, Heller-Sacks Professor of Cardiothoracic Surgery and chief of the Feinberg Division of Cardiac Surgery, an inventor himself who serves as a clinical mentor for the course. Students must convince McCarthy and other experts that their concepts are worth producing.

“I learned how to develop a medical device early in my career by watching my mentors; I enjoy sharing this knowledge with Northwestern students who wholeheartedly embrace the task,” McCarthy says.

Also a faculty director, McCarthy meets weekly with his colleagues from the engineering, law, and business schools — discussing the course’s progress and planning classes, which feature case studies, lectures, and guest speakers from the industry.

“Each student gains something unique from this course, but all are forced to face up to the real world challenges of the medical invention process,” says McCarthy. “By showing students the path from idea to impact, we are offering them the tools they need to be successful partners in a company managed by professionals from a range of disciplines.”

NUvention: Medical Innovation is largely supported by gifts from a range of major medical device companies. Representatives from these corporations comprise the majority of the advisory board, which convenes at Northwestern on two occasions during the class. In November, the students offer a sneak peek to board members, who offer constructive criticism, call attention to potential regulatory issues, and provide teams with honest feedback. At the end of the course in March, each team presents their business plan, with the board playing the role of potential investors.

The course is first and foremost an academic experience; however, students are not discouraged from advancing their ideas. In fact, several NUvention companies have retained a life outside the classroom, with previous teams continuing to work on such innovations as improvements in implantable electrical stimulation devices and novel surgical instrumentation.

While heading to the Cleveland Clinic to begin his urology residency in several months, Haywood already has plans to use his NUvention knowledge in the years to come.

“Learning basic law, business, and engineering vocabulary from my peers in different disciplines stretched my capabilities as a future physician,” he says. “I go about my days considering unmet clinical needs. Now I know that I am capable of conceiving a solution.”

For more information about the course, contact Dave Johnson: davej@northwestern.edu or (312) 503-7934.
Kenzie A. Cameron, PhD, MPH, BS ’92, MA ’08, research assistant professor in medicine and preventive medicine, grew up in State College, Penn.

Active in the music program throughout elementary and high school, she played and performed in nearly every possible ensemble or group, including the wind ensemble, jazz band, marching band, a cappella concert choir, show choir, and madrigal ensemble. She completed her undergraduate degree in communication at Northwestern University, and was a proud member of the Wildcat Marching Band.

After undergrad, she spent a year and a half in Moscow, working as an English language editor for multiple journals of the Russian Academy of Sciences. She returned to the States to attend graduate school at Michigan State University in the Department of Communication, receiving both an MA and a PhD. Her graduate studies focused on social influence, health communication, and interpersonal communication. Prior to joining Feinberg, she was on the speech communication faculty at the University of Georgia.

While not currently involved in the music or the arts as a performer, Cameron and her husband hold season tickets to the Lyric Opera, the Goodman, and Steppenwolf. She is also training for the 2011 Boston Marathon.

What are your research interests?

My background in social influence provides the foundation for my research, which focuses on message design using communication and social science theories, models, and principles. I am interested in the development and design of the messages that patients are provided, whether by their providers, the media, or educational materials to which they are exposed. My research has also had an underlying focus on addressing racial and ethnic health disparities, particularly in the realm of preventive care.

What is the ultimate goal of your research?

I have always believed it critical to remember that individuals receive information and messages through multiple channels and from numerous others. Thus, if we are to develop a message that is meant to allow patients to better understand a medical concept, persuade them of the need for preventive care, or introduce them to unfamiliar medical terminology, it is not enough to merely provide them with information and leave it at that. I think many persuasive health-related messages fail because they simply provide a “strong argument” for engaging in a particular behavior. However, if we fail to address the concerns of the patient, or if we fail to acknowledge deeply held beliefs and attitudes, we are unlikely to change those attitudes and/or behavior.

Thus, the ultimate goal of my research is to develop and disseminate health-related messages (whether print, oral, or multimedia) to allow individuals to make informed decisions about their health and medical care. With my focus on preventive care, I hope to provide patients and community members the information they need (not only the information we believe they need) to make the decisions that will have a positive impact on their current and future health.

What types of collaborations are you engaged in across campus?

My own research is augmented by my colleagues from general internal medicine, gastroenterology, Department of Preventive Medicine, the Institute for Healthcare Studies, the Department of Emergency Medicine, and the School of Communication at Northwestern University.

Within my division, I collaborate with numerous colleagues – my role in many of the studies is either related to message design, qualitative research and analysis, or providing input and expertise related to communication and social science theories. I have served as a co-investigator on studies, as well as in a mentorship role for fellows and junior faculty members. I also work as a co-investigator on projects led by individuals in other departments and divisions at Northwestern (e.g., Center for Genetic Medicine, Department of Emergency Medicine), as well as by colleagues in the Center for Management of Complex Chronic Care at the Hines Veterans Administration. These collaborations mean that, depending on the day... Continued on page 4
and time, I could be focused on research relating to any of the following topics: colorectal cancer, influenza, MRSA, genetic research and biobanking, communication among patients and providers within the emergency department, herpes zoster, discharge safety of hospitalized seniors, admission handoff communication, and obesity and over-weight prevention, among others.

How is your research funded?

In general, my research is funded through the National Institutes of Health: currently I have an R01 titled “Low-Literacy Physician-Patient Intervention Promoting Colorectal Cancer Screening” funded through the National Cancer Institute, and am finishing up an R21 (“The Effect of Fact versus Myth Messages on Receipt of Influenza Vaccination”) funded through the National Institute on Aging. Near the start of my Northwestern career, I was fortunate to be funded by a Career Development Award through the Centers for Disease Control and Prevention, through which I completed an MPH while focusing my research on developing and testing a multimedia intervention aimed at reducing racial disparities in the uptake of the influenza vaccination.

What papers have you recently published and where?

Among my recent or forthcoming publications are:


What are the benefits of working as part of a research team?

I am not only part of one research team, I am part of numerous research teams, some of which I lead, others of which I am co-investigator or collaborator. This team approach is one of the biggest draws for me at Northwestern, and I know I am lucky to be surrounded by colleagues who truly enjoy each others’ company as well as have so much to bring to each project. I believe in the research model that we follow – that any one of us may have a good idea, but by having others’ input and expertise, that good idea can become great. Further, I believe it is really only with that collaboration that we are truly successful. Besides, it is always much more fun to be in the thick of research with colleagues as opposed to striking out solely on your own!

SciVal Funding Search Tool Available for Use

The Northwestern University Office for Research has purchased a subscription to SciVal Funding, a new funding opportunities search tool akin to COS, IRIS and InfoEd SPIN. Some of the unique features of SciVal Funding are:

- Minimal information is required to generate an investigator’s profile; the profile is automatically updated.
- Targeted funding alerts are automatically generated based on the investigator’s profile.
- Funding opportunities are linked to funding history, i.e. list of funded proposals with access to the investigator’s information and abstracts.

As of March 1, Northwestern users have free access to SciVal Funding.

To use the service, investigators can visit www.funding.scival.com/home; no login is required form a Northwestern University IP address. Those accessing the site from a remote location will simply need to create a SciVal user log-in and password, no VPN connection is required.

To learn more about the benefits and functionality of SciVal Funding, visit www.info.scival.com/funding. For additional information about SciVal Funding, contact Fruma Yehiely, PhD, at yehiely@northwestern.edu.
Staff Q&A: Pam Reid, Manager, Cell Imaging Facility and Nikon Imaging Center

Where are you originally from?
I grew up in Northwest Indiana; until I went to university, I thought the governor of Indiana was the mayor of Chicago.

Our family recently relocated back to Chicagoland; it is great to be back in the Midwest! I haven’t lived in this area for more than 20 years and am still struggling to understand the changes that have occurred in that time frame: What landed on Soldier Field? You mean planes can’t land at Meigs Field? (Yes, I have been in another country.)

What is your educational background?
I attended Purdue University in Indiana for my bachelor’s degree, and I also am a registered teacher. I was an early pioneer for Bio Rad confocals, the kind that actually took up a whole room just for the scan head.

What is your role at the medical school?
Most of my role at Feinberg is to make sure imaging users are well-trained to use our instruments and any concerns or issues that arise are dealt with in a timely manner. My role also includes billing management, equipment repairs, facility management, seminar hosting...the list goes on.

My background is light microscopy, which I use with our confocals, spinning discs, epi-luminescence, brightfield etc. I am starting to learn more about the electron microscopy side of the facility and find it fascinating. Our core has users from the Robert H. Lurie Comprehensive Cancer Center, Feinberg, Northwestern Memorial Hospital, and the Evanston campus, as well as outside the University. We work with a variety of projects, and the diversity makes work fun.

Tell us about a current project you’re working on.
Currently I am in the process of working with the Nikon Imaging Center to create a macro for their software program that will allow users to stitch together fields of view from a incubation microscope we have on site. This process can be tedious if done by hand, but a macro that is flexible for different users would save hours of time.

Why did you choose to work at Northwestern?
I started working at Northwestern in December of 2010 because I have a passion for microscopy and love to teach. When I looked into various paths, the Cell Imaging Facility was my calling.

What is your favorite part of the job?
Working with the new users. I really enjoy seeing people walk away with the satisfaction that they learned something helpful to their research. I also enjoy hearing about the projects they are working on, because sometimes I get sad I am not doing bench work.

What do you like to do in your spare time?
I enjoy spending my free time with my family. We have a lot of fun getting out and doing adventurous activities. Any time we can go sailing on Lake Michigan is fantastic. I also am a huge bicycle enthusiast; you may see me around campus on my folding bike in the summer or on my “big girl’s bike” in the winter.

Core Fact
The annual Research Core Facilities User Satisfaction Survey, sponsored by Feinberg, the Robert H. Lurie Comprehensive Cancer Center, and the Northwestern University Office for Research, is now available online at https://coresurvey.nubic.northwestern.edu/.

The cores are a critical component of the research program at Northwestern University, and your continued feedback is essential to guiding ongoing development of these facilities. Please take a moment to answer the survey.
NIH News

Durbin Protests NIH Funding Cuts
U.S. Sen. Dick Durbin (D-IL) was joined by Steve Rosen, MD, director of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, at a press conference on February 27 to protest the House of Representatives' proposed $1.6 billion cut to the National Institutes of Health's budget.

Before the press conference at the Lurie Cancer Center, Durbin toured Rosen's lab to see first-hand the essential research being conducted there.

"Not only would these spending cuts slow or halt important medical research, they would result in significant job losses and a slowdown in local business activity across the state," Durbin told an audience of scientists and media.

Last year Illinois received $884 million in NIH funding — $775 million of which went to research centers in the Chicago area — which created or supported nearly 12,000 jobs across the state, Durbin noted.

Rosen said the proposed reduction of NIH support would have catastrophic consequences. He said it would stifle creativity, drive talented researchers from the field and derail "the remarkable momentum witnessed over the last decade."

"Cancer is a devastating illness, and, though we have made great strides through biomedical research, much work lies ahead," Rosen said. "The consequence (of the cuts) is a delay in medical breakthroughs that offer hope for our children and future generations."

Feedback Sought
The NIH has issued a Federal Register Notice requesting public comments on (1) NIH's adoption of the eighth edition of the Guide for the Care and Use of Laboratory Animals as a basis for evaluation of institutional programs receiving or proposing to receive Public Health Service support for activities involving animals, and (2) if NIH decides to adopt the eighth edition of the Guide, the proposed implementation plan, which would require that institutions complete at least one semiannual program and facility evaluation using the eighth edition of the Guide as the basis for evaluation by March 31, 2012. Public comments may be submitted online.

Sponsored Research
Wayne Anderson, PhD
Professor in Molecular Pharmacology and Biological Chemistry

Project title: "Midwest Center for Structural Genomics"

Sponsor: Department of Energy (via UChicago Argonne, LLC, Argonne National Laboratory)

The Midwest Center for Structural Genomics is one of four centers funded by the National Institute of General Medical Sciences Protein Structure Initiative to provide high throughput structure determination capability. It is a multi-institutional consortium that develops and applies integrated methods for highly efficient determination of protein structures to important biological problems. The center will make resources for high-throughput structure determination available to a large community of scientists. The majority of targets for structure determination will be defined through partnership arrangements and an open, on-going community nomination process. Among the focus areas of the center are bacterial pathogenesis and providing information essential for antimicrobial drug discovery.
New Clinical Trial

**Title:** Discovery and Validation of Proteogenomic Biomarker Panels in a Prospective Serial Blood & Urine Monitoring Study of Kidney Transplant Recipients – Transplant Proteogenomics

**Sponsor:** National Institute of Allergy and Infectious Diseases (NIAID)

**Investigators:** John Friedewald, MD, Assistant Professor of Medicine & Surgery – Nephrology and Organ Transplantation and Michael Abecassis, MD, Professor of Surgery and Microbiology and Immunology

**Collaborators:** The Scripps Research Institute, Mayo Clinic Arizona, University of Nebraska, The Cleveland Clinic, Medical University of South Carolina

Management of kidney transplant recipients is complicated by the need for invasive diagnostic tools such as kidney biopsies to diagnose common problems (kidney rejection, chronic allograft nephropathy). Having reliable, non-invasive diagnostic tools would allow for more rapid and less risky management of patients living with a kidney transplant.

By analyzing transcription of certain genes (genomics) and the levels of certain proteins (proteomics) in the blood and urine of patients, our team has discovered patterns (signatures) of gene and protein expression that can reliably diagnose different conditions. Based on the gene signatures developed by our main collaborator, Dr. Daniel Salomon at the Scripps Research Institute, we plan to follow 300 kidney transplant recipients from the time of transplant. We will collect blood and urine samples periodically to see if the gene signatures are not only diagnostic of certain problems like acute rejection, but also if they can predict the occurrence of rejection before it happens.

The Clinical Trials in Organ Transplant (www.ctotstudies.org/) are a series of multi-center clinical trials funded by the NIAID. The Comprehensive Transplant Center at Northwestern is one of four centers around the US funded to perform these trials and to form their own research consortia.

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Northwestern University Feinberg School of Medicine

**ABSTRACTS DUE**

**MARCH 21**

* SUBMIT AN ABSTRACT

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**Seventh Annual Lewis Landsberg Research Day**

Thursday, April 7, 2011 from 1 to 5 p.m.
Robert H. Lurie Medical Research Center, 303 E. Superior (Chicago campus)
Research in the News

**MSN.com** February 28
Confusion over dosing common for seniors
Dr. Michael Wolf’s research was featured.

**Los Angeles Times** February 28
Keeping sleep apnea sufferers’ airways open
Dr. Phyllis Zee was quoted.

**New York Times** February 26
New NFL standard for assessing players suspected of having concussions
Dr. Hunt Batjer’s work was featured.

**Discover Magazine** February 16
Waking up is hard to do
Dr. Ravi Allada’s research was featured.

**US News & World Report** February 18
Waking up is hard to do
Dr. Ravi Allada’s research was featured.

**The Atlantic** February 15
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Wired.com** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Popular Science** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Los Angeles Times** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Chicago Tribune** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**UPI** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Fox News** February 14
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**USA Today** February 13
Wiring up is hard to do
Dr. Ravi Allada’s research was featured.

**Scientists find human DNA in gonorrhea bacteria**
Dr. Hank Seifert’s research was featured.

**Los Angeles Times** February 7
Stem cells for broken hearts
Dr. Douglas Losordo was quoted.

**US News & World Report** February 2
Narrowed leg arteries disable women faster than men: study
Dr. Mary McDermott’s research was featured.

Click [here](#) for more headlines.

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**Welcome New Faculty**

**Hryar Attarian, MD**, joins as associate professor in the Ken and Ruth Davee Department of Neurology.

He most recently was associate professor of neurology and medicine at Loyola University Medical Center and Stritch School of Medicine, where he also served as director of the Neurology Observership Program and co-director of the Loyola Center for Sleep Disorders. He received his Doctor of Medicine degree from the American University Beirut School of Medicine in 1992 and completed residencies in psychiatry and neurology, as well as a medicine internship, at State University of New York, Upstate Medical University in Syracuse.

Attarian’s primary research interests are sleep disorders in multiple sclerosis, the neurological complications of obstructive sleep apnea, and sleep perception. He has served as the primary investigator on six studies, co-investigator and clinical evaluator on 11 studies, and sub-investigator on three clinical trials.

**Yanming Zhang, MD**, joins as associate professor in pathology.

He most recently was assistant professor of medicine and associate director, Cancer Cytogenetics Laboratory, Department of Medicine, at the University of Chicago. He also completed a fellowship in clinical cytogenetics and served as a research associate there. Prior to his time at the University of Chicago, Zhang completed a postdoctoral fellowship at the Institute of Human Genetics, University of Kiel, Germany, where he received his Doctor of Medicine degree.

Zhang’s research interests include studying chromosome abnormalities in patients with myelodysplastic syndrome during the transformation to acute myelogenous leukemia and elucidating the mechanisms of recurring chromosome translocations in de novo and therapy-related leukemia.

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**Editor’s Note**

**Reminder!** Use Plan-It Purple to get your events noticed. Periodically, we receive questions as to how Featured Events (page 9) are selected for inclusion in the *FSM Researcher*. The answer is simple: we use Plan-It Purple, the University’s online calendaring system. Events are typically selected from those included in the Research Office calendar, must contain clear information about the speaker and topic, include a contact name and e-mail address, and list a start and stop time.

If you don’t see your event listed in the online calendar, contact Maureen Mwangi in the Research Office at **m-mwangi@northwestern.edu** to get connected.
Funding Opportunities

Specialized Programs of Research Excellence (SPOREs) in Human Cancer for Years 2010, 2011, and 2012 (P50) PAR-08-020

More information

Submission Deadline: May 20, 2011
Upper Amount: $2.5 million per year for five years

Synopsis: The National Cancer Institute, the National Institute of Dental and Craniofacial Research, and the National Institute of Neurological Disorders and Stroke at the National Institutes of Health, invite new or renewal (competing) applications for P50 Research Center Grants for Specialized Programs of Research Excellence (SPOREs). The program will fund five-year P50 SPORE grants to support state-of-the-art investigator-initiated research that will contribute to improved detection, diagnosis, treatment, and prevention of an organ-specific cancer (or a related group of cancers). SPOREs are expected not only to conduct a wide spectrum of research activities, but also to contribute significantly to the development of specialized research COREs, improved research model systems, and collaborative research projects with other institutions. The research supported through this program must be translational in nature and must always be based upon knowledge of human biology stemming from research using cellular, molecular, structural, biochemical, or genetic experimental approaches.

Medical Research Program - Keck Foundation, W.M.

More information

Submission Deadline: May 1, 2011
Upper Amount: $1 million

Synopsis: The Medical Research Program seeks to advance the frontiers of the life sciences by supporting basic research that is high-risk and has the potential to transform its field. Successful projects are distinctive and novel in their approach to problems and push the edge of their field to question the prevailing paradigm. Past grants have been awarded to major research universities, medical schools, and independent research institutions to support pioneering biological research, including the development of promising new technologies, instrumentation, or methodologies. Historically, grants range from $500,000 to $5 million and are typically $2 million or less. In 2011, research grants will continue to be capped at $1 million.

Featured Events

15 Microbiology-Immunology Lecture: “Microbial Ecology of the Gastrointestinal Tract: Friends and Pathogens”
Presented by Vince Young, MD, PhD, University of Michigan at Ann Arbor
Date: Tuesday, March 15 Noon to 1 p.m.
Location: Lurie Medical Research Center Baldwin Auditorium 303 E. Superior St. (Chicago campus)
Contact: m-mandel@northwestern.edu
More information

16 Medical School Lecture Series: Bioengineering and HIV testing
David Kelso, the director of the Center for Innovation in Global Health Technologies at Northwestern
Date: Wednesday, March 16 Noon to 1 p.m.
Location: McGaw 2-322 240 E. Huron St. (Chicago campus)
Contact: onebook@northwestern.edu
More information

17 Endocrinology Seminar: “Serum Screening to Predict Preeclampsia”
Presented by Geralyn Lambert-Messerlian, PhD, associate professor, Brown University
Date: Thursday, March 17 4 to 5 p.m.
Location: Lurie Medical Research Center Baldwin Auditorium 303 E. Superior St. (Chicago campus)
Contact: p-yim@northwestern.edu
More information

18 Malkin-Kraft Lectureship: “The Decade of RNA Non-coding/Coding”
Presented by Philip A. Sharp, PhD, Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology
Date: Tuesday, March 22 4 to 5 p.m.
Location: Lurie Medical Research Center Hughes Auditorium 303 E. Superior St. (Chicago campus)
Contact: d-marshall4@northwestern.edu
More information

22 Commercialization Clinic
Hosted by INVO and NUCATS. By appointment only. Appointments must be made by March 11.
Date: Tuesday, March 22 8:45 to 11:30 a.m.
Location: Lurie Medical Research Center Kabiller Conference Room 303 E. Superior St. (Chicago campus)
Contact: m-melar@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.