A vigorous stem cell transplantation program as well as regenerative and repair medicine programs at Northwestern are strengthened by the presence of a Good Manufacturing Practices (GMP) lab, one of the premier facilities in the region. Directed by Richard Meagher, PhD, research associate professor of medicine, Division of Hematology-Oncology, Feinberg School of Medicine, the lab is a pharmaceutical-grade facility which collects, manipulates, processes and stores cells and tissue intended for use in human treatment according to federal regulations.

“Stem cell treatment at most centers, including Northwestern, is most commonly used to treat patients with leukemia, lymphoma and multiple myeloma when other treatment options have failed,” Meagher explains. “Our GMP laboratory also harvests islet cells, which are those cells found in the pancreas and used in treating patients with so-called ‘brittle’ diabetes, in which insulin treatment is no longer effective.”

Meagher adds that the lab works with stem cells from several sources, including adult stem cells, taken from a patient or donor organ, and embryonic stem cells, those harvested from a human embryo. “Our lab is a valuable tool for use by any clinician using cell or tissue transplantation and for those involved in clinical trials exploring new and better ways to use these cell therapy options across a spectrum of diseases.”

The most common cell therapy, stem cell transplantation, can be autologous — meaning that the cells are harvested from a patient’s own body — or allogenic, coming from a related or unrelated donor source.

The Lab
The lab, located in the Olson Pavilion (Chicago campus), was created in
response to the Northwestern community’s longstanding commitment to using stem cell and islet cell therapies in patients with a range of diseases.

Jayesh Mehta, MD, professor of medicine, Division of Hematology-Oncology at Feinberg, and a noted expert in stem cell transplantation, was one of the principal proponents of establishing a state-of-the-art lab.

“Dr. Mehta was committed to providing Northwestern researchers and clinicians with a top-flight lab that could enhance and improve the success of stem cell and islet cell transplantation,” Meagher says. “We worked together to apply for a grant that would help support this effort and our vision became a reality.”

Meagher explains that the Food and Drug Administration designation of “GMP” means that the manufacturing processes used are highly controlled and constructed to ensure quality and safety:

- The lab has four “clean” rooms, each of which features a controlled airflow system that changes the air 40 times per hour.
- The lab’s design enables four separate activities to occur simultaneously. Says Meagher, “One of our rooms is dedicated to working with islet cells.”
- In the “cold room” within the islet cell worksuite, the air is changed 90 times an hour.
- Full bio-safety garments are worn by Meagher and his team, which includes six technicians.

The lab staff also includes four administrative employees. Leo Gordon, MD, professor of medicine, Division of Hematology-Oncology at Feinberg, serves as the medical director.

Meagher points out that centers performing stem cell transplants are not required to have a clean room such as the ones in Northwestern Memorial Hospital’s GMP lab. “But it is such an advantage to programs such as ours because it helps assure that the final product — the cells being transplanted into a patient for treatment purposes — works as successfully as possible.”

He adds that one of the lab’s priorities is to help reduce the risks of graft vs. host disease, a complication that sometimes occurs in patients undergoing bone marrow stem cell transplantation, even when the donor cells come from a close relative. It occurs when the T cells from the donor respond to the recipient tissue as “foreign” and attack the transplant patient’s body.

“The controlled environment of this lab and the safeguards we employ there help improve the chances for the success of transplant procedures,” Meagher says.

**Stem Cell, Islet Cell Treatments Not New, But Expanding**

Though stem cell research has been the subject of much public discussion in recent years, the use of stem cells in treatment is not new. “In fact, the first stem cell transplantation was performed in the U.S. in the 1950s,” says Meagher. “In recent years, however, our increasing understanding of their usefulness has led to tremendous growth in clinical use and in research.”

It is now thought that stem cells might be used to treat patients with heart disease, vascular problems, Parkinson’s disease, other neurologic conditions, spinal cord injuries, and much more.

“This is fertile ground for researchers and clinicians,” Meagher says. “It’s another reason why it’s vital for an institution of this stature to offer the most advanced cell and tissue lab possible. Translational research, which is a priority at Feinberg and in the Northwestern community, is aimed at providing new, more effective treatments for our patients today and in the future. We must be there to support those efforts.”

### WELCOME NEW FACULTY

**Stephen Farmer, MD, PhD**, joins as an assistant professor of medicine, Division of Cardiology. He received his doctorate degree in health services research from the London School of Hygiene and Tropical Medicine, University of London, and his Doctor of Medicine degree from the Yale University School of Medicine. Prior to joining Feinberg, Farmer completed his fellowship in noninvasive cardiology at the Hospital of the University of Pennsylvania in Philadelphia.

**Elizabeth Gerard, MD**, joins as an assistant professor of Neurology. She received her Doctor of Medicine degree from Mount Sinai School of Medicine, New York. Prior to joining Feinberg, Gerard completed her fellowship in epilepsy and clinical neurophysiology at the Columbia Comprehensive Epilepsy Center in New York.

**Piotr Kulesza, MD, PhD**, joins as an assistant professor of pathology. He received his Doctor of Medicine and doctorate degree from the Washington University School of Medicine, St. Louis. Prior to joining Feinberg, Kulesza was an assistant professor and associate scientist at the University of Alabama Experimental Therapeutics Program and Cancer Center in Birmingham.
At the tender age of 33, Dr. Colby Shad Thaxton is already becoming a familiar name within the scientific community. After spending less than one year conducting independent research in the Feinberg Department of Urology, Thaxton was named “Researcher of the Year” by *Bioscience Technology* magazine, is a 2009 recipient of the Howard Hughes Medical Institute (HHMI) Early Physician-Scientist Award and was named one of the world’s top innovators under age 35 by *MIT Technology Review* (TR35).

Of course, Thaxton is no stranger to exceeding expectations. While studying to become a physician at Feinberg, he was inspired by an article on Dr. Chad Mirkin, director of the International Institute for Nanotechnology and Northwestern University professor of chemistry, chemical and biological engineering, biomedical engineering, materials science and engineering and medicine. Thaxton then applied for and received an HHMI medical student fellowship and spent the following year conducting research in Mirkin’s laboratory. Ultimately, Thaxton simultaneously completed his doctorate degree in the graduate school while a resident in the Urology Department.

Thaxton now conducts research in his own laboratory and has formed multiple collaborations with other Northwestern scientists in the pursuit of creating novel therapeutics that support the mission of translational science. His research currently focuses on using nanotechnology in areas such as improving prostate cancer diagnostics, producing effective therapies for bladder, liver and pancreatic cancers and creating new methods for treating cardiovascular disease.

I have two main interests, the first being the development of synthetic high density lipoproteins (HDL) as therapeutic agents for atherosclerosis and cardiovascular disease, and the second being the use of nucleic acid functionalized gold nanoparticles as diagnostic and therapeutic agents for any number of disease processes, but specifically for cancer.

Beyond materials synthesis and characterization, we are focusing on developing methods and assays for determining the biology of these interesting particles. Ultimately, what we want to know is, how do they function in biological systems? Do they traffic to the cells responsible for atherosclerosis and extract cholesterol from them? Do they work in animal models of atherosclerosis?

Why did you join Northwestern?
I have been a part of Northwestern for a long time; I came to Northwestern as a medical student and decided to stay due to the opportunities in nanotechnology research. There is a strong focus on nanotechnology and on maintaining Northwestern’s position as a leader in this field — particularly translational nanotechnology. Not only have I benefited from all the wonderful basic science research at Northwestern, but it’s exhilarating to be a part of the drive for bringing nanotechnology into the clinic.
Student Profile: Angela Anderegg, Northwestern University Interdepartmental Neuroscience (NUIN) Program

Where is your hometown?
I grew up in Dublin, Ohio, which is a northwest suburb of Columbus. Our town’s biggest claim to fame is that we host the Memorial Tournament (part of the PGA Tour) each spring.

Where did you go for your undergraduate degree?
I attended Vanderbilt University in Nashville, Tenn., where I double majored in neuroscience and Spanish.

What are your research interests?
My main focus is on developmental neuroscience. Specifically, I am interested in understanding the molecular processes that govern the birth and specification of distinct neuronal populations and how we might harness these processes to engineer stem cell-based therapeutics for disease.

What exciting projects are you working on?
The dysfunction and loss of midbrain dopamine neurons contribute to many neurological disorders, including Parkinson’s disease (PD). Thus, one of the main goals in the Awatramani Lab is to define the molecular cascades involved in midbrain dopamine neuron development in order to better understand PD and formulate more effective therapeutics. One current and exciting avenue for PD treatment is stem cell-based therapy. Toward this end, our studies aim to define the developmental basis of dopamine neurons so that the molecular programming of ES cells into bona fide dopamine neurons can be refined. In particular, my thesis project aims to investigate the role of microRNAs (a recently discovered class of evolutionarily conserved, non-coding, regulatory RNAs) in the development of midbrain dopamine neurons.

What attracted you to the NUIN program?
After finishing my undergraduate degree, I wasn’t sure whether I wanted to pursue an MD or a PhD, so I spent a few years working as a technician in the Jill Morris Lab at Children’s Memorial Hospital while deciding. Through this experience, I was able to learn a lot about the NUIN program and had the opportunity to get to know many of the students and faculty. Overall, I was impressed with the extensive faculty involvement, cutting-edge research, access to first class facilities and highly collaborative nature of the program.

How often do you travel between the Evanston and Chicago campuses?
I actually live in Evanston and work in a lab downtown, so I commute back and forth every day.

What do you like to do for fun?
My husband and I love to travel – either to explore new places or to visit with family and friends. I also enjoy biking, playing golf, and doing home-improvement projects. Recently, I have been taking woodworking classes and learning to build furniture in my spare time.

What are your plans for after graduation?
After graduation I would like to obtain a post-doc in a developmental neuroscience lab. Long term, I hope to stay in academia and start my own lab.

ANIMAL RESEARCH CORNER

Changing procedures on your protocol? Adding or removing personnel? Increasing animal numbers? All of these require the submission of an addendum to the IACUC office.

The addendum form may be found at the IACUC web site www.research.northwestern.edu/oprs/acuc/:

• Click on the Forms tab and enter your NU NetId and password.
• Scroll down the Single Protocol Addenda and click on the link, which will open the addendum form.
• Once the form is completed, you may submit it to the IACUC office at acuc@northwestern.edu.
• Approval times for addenda vary based on the changes being made.

Personnel changes are the most common type of addenda submissions. If you have a new person starting in your lab, visit the training page on the IACUC web site for information regarding the AALAS Learning Library and Occupational Health enrollment, both of which are requirements for being added to a protocol.

Once the requirements are met, approvals for these types of addenda usually occur within one to two business days. It is also important to remove personnel from the protocol that are no longer participating in the study and return access cards to CCM. Access cards may be returned to the 13th floor of the Searle building in Chicago and the main office in the basement of the Pancoe building in Evanston.
How long have you been at NU?
I’ve worked at Northwestern University for nearly four years, entirely in the Office of Development.

Where are you from?
I’m Canadian, born in Toronto. In 2002, at the age of 28, I moved to Boston with my Chicagoan fiancée (we met in 2000 at a wedding in Indiana). We moved to Manhattan after Boston, and then to Chicago in 2005. I became an American citizen in September 2008 in a courtroom full of people who had traveled considerably further, in every sense, than my 500 mile drive west.

What’s your educational background?
I majored in psychology with minors in English and philosophy at the University of Toronto; I graduated with an honors Bachelor of Arts degree. Before that I graduated from high school, but I can’t recall much of the educational aspect.

What is your role at the department?
In the broadest sense, I’m a writer. I arrange letters and words in a meaningful way. Breaking that down, I try to communicate progress made possible by philanthropy — research advances, education initiatives, and community engagement efforts that are supported by private contributions. So many people want to improve our collective capacity to care for each other — our office works daily to convince people that supporting Northwestern University is the best way to make that happen sooner. We advocate on behalf of Northwestern’s leadership, faculty and programs because we believe the best chance for improving the world’s health is by supporting the people we work alongside here at Northwestern.

Why did you choose to work here?
Our culture encourages people, whenever possible, to work for more than 40 hours a week, which is a good chunk of my waking life. It’s better to spend that time increasing people’s happiness and/or decreasing their suffering. My only talent is writing, so this gig made the most sense.

What do you like/dislike about your job?
The glass ceiling of a medical doctorate stands between me and the chance to perform surgery (legally) — this gets me down at times. But the same glass ceiling keeps me from ever closely examining an eyeball or a fungal infection, something for which I will always be grateful.

What are your hobbies or favorite books, movies?
I play guitar, sing, write songs, record them and still think people need to hear them. Ghostbusters contains the only secrets to life anyone really needs to know (movie or screenplay): there’s more to this all than anyone can know, the world’s full of people who will tell you what you can’t do and all that matters in the end is that you keep trying (even if your girlfriend helps summon giant possessed marshmallows to take you down).

What’s a typical day like for you?
The only thing typical about my days is the physical location of my office; if a day repeats itself beyond that I’ll be shocked. I’m fortunate to work with an office full of dedicated people who raise funds for the medical school’s priorities. Every day is an education (often a humbling one). I write about the importance of scholarships to students in the morning and about the genetics involved with familial amyotrophic lateral sclerosis in the afternoon. Most days are rewarding; I’d be lying if I said some days weren’t confounding.

Is there anything else you’d like to add?
Many thanks for all this recognition and for the efforts of those who took time to nominate me so compellingly for this honor.
On August 28, Northwestern University President Morton Schapiro toured the Feinberg School of Medicine and presented opening remarks at the medical school’s Founders’ Day Convocation. In the process, he met Feinberg researchers, clinicians, educators and students. President Schapiro succeeds Henry S. Bienen, who retired in August after serving 14 years as Northwestern University’s president.

“...I’m eager to take on both my roles as president and professor.”
- President Morton Schapiro
**Sponsored Awards**

**Symal K. Datta, MD**
Solovy/Arthritis Research Society
Professor of Medicine and Professor of Microbiology-Immunology

**Project Title:** Genetic, Viral and Immunologic Studies in New Zealand Mice

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

We have identified the critical histone peptide epitope/s in nucleosomes of apoptotic cells, which stimulate and drive the pathogenic autoimmune response in lupus. We have used these peptides in nanomolar doses as vaccines to block systemic autoimmune disease and restore immunoregulation. The current grant is focused on molecular mechanisms by which the peptide tolerance therapy affects antigen presenting cells (APCs) — generating tolerogenic plasmacytoid dendritic cells (pDC) that cause expansion of autoantigen-specific regulatory T (Treg) cells and contraction of autoimmune and inflammatory T helper (Th1 and Th17) cells. On the other hand, we will also determine how a novel APC population initiates break-down of tolerance to nuclear antigens to induce pathogenic Th1 and Th17 responses in lupus and other autoimmune disease, and how this priming step can be blocked.

**Jindan Yu, MD, PhD**
Assistant Professor, Division of Hematology/Oncology

**Project Title:** Delineating the Regulatory Network of Master Transcription Factors in Prostate Cancer

**Sponsor:** U.S. Department of Defense

Prostate cancer is a leading cause of cancer-related death in American men, second only to lung cancer. It is regulated by a number of transcription factors including androgen receptor and the Polycomb group protein EZH2. In addition, we recently reported an important role of the ETS family transcription factor ERG in a majority of prostate cancer via its translocation and fusion to the androgen-induced gene TMPRSS2. However, little is known about how these transcription factors together, either synergistically or antagonistically, regulate the disease. In the proposed studies, we will map the genomic landscapes of these transcription factors using high-throughput ChIP-Seq assays and investigate the downstream pathways. It is possible that these transcription factors cross-talk and orchestrate the progression of prostate cancer.

**IRB-Call for Nominations**

The Office for the Protection of Research Subjects is soliciting nominations for both faculty and community representative members for service on one of the six Institutional Review Boards. New members are appointed for a three-year term and should be willing to meet at least once a month throughout the year. While it is preferred that nominees have a record of research experience involving human subjects and an informed viewpoint on the ethical treatment of human subjects in research, training will be provided.

Nominations should include a brief letter and a curriculum vitae and be sent to:

- Eileen Yates, IRB manager, Quality Assurance and Training eyates@northwestern.edu
- You may also submit your nomination via e-mail to o-kwiecien@northwestern.edu

If you have any questions, please contact Eileen Yates (312) 503-6011 or Olga Kwiecien (312) 503-6012.
Sponsored Awards, Ctd.

**Sergei Revskoy, MD, PhD**  
*Associate Professor, Research, Division of Hepatology*

**Project Title:** Developmental Aspects of Sexual Dimorphism of Hepatic Tumors: Zebrafish Model  
**Sponsor:** National Cancer Institute

The epidemiology of hepatocellular carcinomas demonstrates strong male gender bias in tumor incidence; however, the effect of gender on hepatocellular carcinoma progression and clinical outcome remains controversial.

In order to dissect molecular mechanisms responsible for sexually dimorphic behavior of hepatocellular carcinoma, we will utilize transplantable tumors in clonal zebrafish — a model recently developed in our lab. This novel system provides unique tools for the investigation of developmental aspects of tumor-host relationships focusing on changes in the tumor behavior and the gene expression signatures depending on a gender of the host organism.

Our preliminary data indicates that hepatomas retain considerable phenotypic plasticity in different microenvironmental contexts of the host organism. A comparison of gene expression profiles of tumors transplanted to syngeneic fish of either gender at different maturational stages will delineate gender-specific molecular pathways that either promote or counteract development of hepatocellular carcinoma.

The transgenically-induced tumor lines expressing fluorescent tags in optically transparent animals will further facilitate in-depth analysis of invasive tumor growth, angiogenesis and metastasis by vivo imaging. This technique will help to assess sexually dimorphic spatial and temporal progression of hepatomas.

Overall, this model, based on an array of clonal zebrafish lines, will reveal novel targets for experimental therapy for hepatocellular carcinoma, which remains a tumor with poor prognosis and significant initial or acquired chemoresistance.

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**FSM in the News**

***Chicago Tribune***  
August 25, 2009

**Holdout smokers: Who they are and why they can’t quit**

...The group that smokes the most? The mentally ill.

According to studies, people with mental illness smoke at nearly twice the rate as those without such disorders.

Studies have identified a common genetic vulnerability to both mental illness and nicotine addiction, said Brian Hitsman, an assistant professor of preventive medicine at the Northwestern University Feinberg School of Medicine who researches tobacco use among psychiatric patients.

Beyond the physical addiction, smokers repeatedly pointed to the stress relief that smoking provides…

But the habit isn't all that calming. For heavy smokers who can't get their fix, withdrawal symptoms including nervousness, irritability and restlessness can develop in as little as two hours, Hitsman said…

***USNews***  
August 19, 2009

**Clinical Trials Are Testing Stem Cells as Heart Failure Treatment**

A bounty of trials are exploring the healing potential of injecting stem cells into ailing hearts …

... No stem cell therapy for heart failure is going to be a cure-all, experts acknowledge. "Even as a wildly optimistic guy, I don't imagine that anything I do on a single day in the cath lab is going to reverse 30 years of disease," says Douglas Losordo, director of the Program in Cardiovascular Regenerative Medicine at the Northwestern University Feinberg School of Medicine, who is leading a 10-person heart failure pilot study using stem cells derived from patients' own blood.

***msnbc.com***  
August 12, 2009

**Owie! Hundreds of ways to say ‘it hurts’**

Pain can be stabbing, searing or throbbing. It can be sharp or dull. It can make you tired, depressed or anxious. It can be incapacitating — or only mildly annoying. Millions of Americans are affected by chronic pain, studies show, yet until now it's been difficult for doctors or scientists to understand how much a patient is actually suffering. Now, a computer program that measures and rates pain may help put doctors and their patients on the same page…

Just as a blood sugar test can diagnose diabetes, a standardized scoring system will be able to register the impact of pain on a person's life, says David Cella, the program's developer and professor and chair of the department of medical social sciences at the Northwestern University Feinberg School of Medicine...

To read more headlines, visit:  
www.feinberg.northwestern.edu/news/
Funding Opportunities

Medical Rehabilitation Research Resource (R24)
Submission deadline: 10/1/2009

Amount: This FOA will utilize the Resource-Related Research Projects (R24) grant award mechanism. An applicant may request a project period of up to five years and a budget for direct costs of up to $700,000 per year. Cost sharing is not required.

Synopsis: This Funding Opportunity Announcement (FOA), issued by NICHD, NINDS, and NIBIB, National Institutes of Health, solicits grant applications from institutions/organizations that propose to build research infrastructure for medical rehabilitation. The aim of this FOA is to create a national network of research cores that provide access to collateral expertise in biomedical, behavioral, and/or psychosocial fields that are particularly relevant to medical rehabilitation research. Applicants should propose a program of research resources and collaborative opportunities in a specific content area. This may be accomplished through a combination of didactic interactions (workshops, courses, written material, and websites), consultations and pilot funding. In addition, the research core may support intramural activities related to technique development, adaptation, and validation. Although examples of relevant expertise and content are provided below, additional areas may be proposed provided they have potential for promoting medical rehabilitation research and improving outcomes for people with disabilities.

Basic and Clinical Studies of Congenital Urinary Tract Obstruction (R01)
http://fundingopps.cos.com/cgi-bin/fo2/getRec?id=119657&if=search
Submission deadline: 10/1/2009

Amount: This FOA will utilize the NIH Research Project Grant (R01) grant. Budgets for direct costs of up to $500,000 per year and a project duration of up to five years may be requested. Cost sharing is not required.

Synopsis: Congenital obstructive uropathy is one of the major causes of chronic kidney disease and end stage renal disease (ESRD) in infants and children. The pathogenesis of this disorder, however, remains poorly understood. Many controversies and clinical uncertainties exist in the detection, prognosis, and effective treatment strategies for this condition. The impact of early fetal detection and neonatal intervention, the long-term effects of watchful waiting and the various surgical interventions have not been well studied and documented. There is also no consensus on the indications for, or ideal timing of surgical intervention. The purpose of this funding opportunity is to address the numerous scientific and clinical uncertainties related to the development, treatment and prognosis of congenital obstructive uropathy, by encouraging and facilitating research in diverse areas. These areas include: the development of objective prognostic markers; the genetic determinants of this congenital disorder; the development of reliable animal models of the disorder; and, evaluation of the long-term effectiveness of various treatment strategies.

To view more funding opportunities, visit:
www.feinberg.northwestern.edu/research/funding-opportunities/

Featured Upcoming Events

8 Bloodborne Pathogens Training
This course covers the University policies regarding OSHA’s Bloodborne Pathogens Standard and the Needlestick Prevention Act. The training includes discussion of disease transmission; hazards associated with use of human materials; safe work practices, engineering controls, and personal protective equipment used to minimize or eliminate exposure; emergency response procedures; and post exposure evaluation and follow up. You must register to attend.

Date: Tuesday, September 8**
Time: 10 to 11:30 a.m.
Location: Technological Institute NG71
2145 Sheridan Road (Evanston)
Contact: Steven Karlman 312.503.8300

** Note: Multiple times and locations offered for this course. To learn more, visit http://www.research.northwestern.edu/ors/training/courses/BBPTraining.htm

17 IHS Seminar Series: Melinda Stolley, PhD
Institute for Health Research and Policy (IHRP)
Dr. Stolley’s research interests primarily focus on cancer survivorship with a special emphasis on under-served populations. She also develops and conducts lifestyle interventions to promote health among survivors. An additional interest is the prevention of obesity among young children.

Date: Thursday, September 17
Time: Noon to 1:00 p.m.
Location: Weibolt Hall Room 421
340 E. Superior Ave. (Chicago)
Contact: Allan Doeksen 312.695.4903

18 2009 Incoming Graduate Student Laboratory Safety Training
This training covers OSHA’s Laboratory Standard, general laboratory safety, Material Safety Data Sheets (MSDSs), personal protective equipment (PPE), chemical storage, waste disposal, reporting injuries and illnesses, and responding to emergencies.

This training is intended for incoming graduate students who will be conducting research in University laboratories. If your research involves the use of chemicals, this training is appropriate for you.

Save your space and register today. Bring your University WildCARD.

Date: Thursday, September 17 and Friday, September 18, 2009
(Only one session is required)
Time: 9 a.m. to noon
Location: Technological Institute Lecture Room 3(LR3)
2145 Sheridan Road (Evanston)
Contact: Steven Karlman 312.503.8300

For more events, visit
www.feinberg.northwestern.edu/research/calendar/

Event organizers are encouraged to submit calendar items on Plan-it Purple.