Feinberg School of Medicine researchers appear to have reversed neurological dysfunction in early-stage multiple sclerosis (MS) patients by transplanting their own immune stem cells into their bodies, thereby "resetting" their immune systems. The principal investigator for the study, which will be published in the March issue of *The Lancet*, is Richard Burt, MD, chief of immunotherapy for autoimmune diseases at the Feinberg School of Medicine. Dr. Burt holds the same title at Northwestern Memorial Hospital, where the clinical trial was performed.

Multiple sclerosis is an autoimmune disease in which the immune system attacks the central nervous system. Most patients with MS present with intermittent symptoms that are commonly, at least partially, reversible. This form of the disease is termed, "relapsing-remitting" MS. During this time, the person will either fully or partially recover from the symptoms experienced during the attacks, which may include visual problems, fatigue, sensory changes, weakness or paralysis of limbs, tremors, lack of coordination, poor balance, bladder or bowel changes, and psychological changes. Over time, usually from 10 to 15 years after onset of MS, most patients with relapsing-remitting MS progress to a later stage called secondary progressive MS, which manifests as irreversible and gradual neurological impairment.

Dr. Burt and his research team conducted a small phase I/II clinical trial that included 21 patients, ages 20 to 53, who had relapsing-remitting MS that had not responded to at least six months of treatment with interferon beta. The patients have MS for an average of five years. The stem cell transplant procedure began with the patients receiving chemotherapy to destroy their immune system. They were then injected with their own immune stem cells, which were obtained from the...
Meet John G. Csernansky, MD

John Csernansky, MD  
Lizzie Gilman Professor of Psychiatry and Behavioral Sciences, Chair of the Department of Psychiatry and Behavioral Sciences

What are your research interests?
My research interests include in vivo neuroimaging of neuropsychiatric disorders, especially schizophrenia and Alzheimer’s disease, clinical trials of cognition-enhancing drugs, and the development of animal models for neuropsychiatric disorders with greater validity.

What projects are currently under way?
We are currently using structural and functional magnetic resonance (MR) imaging to collect information about the location and magnitude of abnormalities of brain structure and function in patients with schizophrenia and Alzheimer’s disease. In schizophrenia, we have found evidence of a progressive loss of gray matter in frontal and temporal regions of the cerebral cortex and in the subcortical structures that are related to these cortical regions. In Alzheimer’s disease, our findings suggest that measures of gray matter loss in medial temporal lobe structure can be used as biomarkers of early disease.

What are the goals of your research?
The goal of my research program is to improve the validity of psychiatric diagnosis in patients with schizophrenia, Alzheimer’s disease, and related disorders using measures of brain structure and function. In addition, measures of brain structure and function should also be useful as markers of the impact of new drug and non-drug treatments on disease processes.

What brought you to the Feinberg School?
I attended the Weinberg College of Arts and Sciences and majored in chemistry — and I was excited by the opportunity to return to my alma mater. I also feel that FSM is poised to enter an exciting new phase of academic growth — and I wanted to be part of that process. My department can and should be an important part of the neuroscience community at Northwestern.

What challenges do you face?
These are very challenging times to initiate new academic programs. The competition for NIH funding is arguably at an all-time high, especially for new investigators. At the same time, providing care for psychiatric patients is under-funded. Therefore, we need to be thinking strategically on a day-to-day basis.

(Continued from page 1)

patients’ blood before chemotherapy, to create a new immune system. According to Dr. Burt, this procedure, called "autologous non-myeloablative hematopoietic stem cell transplantation," has previously been tried in MS patients. "Past studies were done mostly in patients with late secondary-progressive MS," he says. "Some studies have included patients at other stages of MS, including primary-progressive, relapsing-remitting, or relapsing-progressive MS. As described, our study included only patients with relapsing-remitting MS."

"We focus on destroying only the immune component of the bone marrow," he adds. "Then, we regenerate the immune component, which makes the procedure much safer and less toxic than traditional chemotherapy for cancer." After transplantation, the patient's new lymphocytes are self-tolerant and do not attack the immune system.

Dr. Burt reports that after an average follow-up of three years after transplantation, 17 patients (81 percent) improved by at least one point on the Kurtzke expanded disability status scale (EDSS). They experienced improvements in areas in which they had been affected by MS - walking, ataxia, limb strength, vision, and incontinence. The disease also stabilized in all patients. "This is the first time we have turned the tide on this disease," says Dr. Burt. "In MS, the immune system is attacking your brain. After this procedure, it doesn't do that anymore."

Dr. Burt emphasizes that stem cell transplantation for patients with relapsing-remitting MS with active inflammatory disease and frequent exacerbations is a feasible procedure that not only seems to prevent neurological progression but also appears to reverse neurological disability. He notes that the current MS international stem cell transplant (MIST) trial is a randomized study that will further explore the benefits of this approach.

For more information, please contact the Division of Immunotherapy, (312) 908-0059
The December power failure graphically demonstrated significant inadequacies in our infrastructure and our emergency response procedures. We have been working hard with Facilities Management (FM) and University Police to deal with these issues as quickly and completely as possible.

Emergency Notifications

Most of you have received messages from the University’s emergency notification system (ConnectEd), which can send phone, text, and e-mail messages to devices and phone numbers you choose. We are adapting this system for use by the Chicago campus research community. Originally programmed to contact all faculty, staff, and students on both campuses, we are modifying the system allow us to target Chicago campus researchers. Initially, our option will be to send messages to the entire FSM research community. However, the system will need to be used only very rarely in emergencies affecting a large number of investigators, such as the December 26 power failure. We believe most of you would rather get an occasional irrelevant message than miss a vital one. Over time, we hope to be able to target the notifications to specific buildings or floors. Within the next few weeks you should get a test message from this system that will let you know it is operational. In addition, we are working with Facilities and University Police to fully spell out what situations require contact with FSM first responders who will determine when and how to contact individual units, investigators, or the research community as a whole.

Electrical Infrastructure

Although the catastrophic failure on December 26/27 was the first such failure in more than 50 years, it emphasized the need for renewed focus on this central infrastructure. It resulted from unheard-of equipment failures at both ComEd and University. We are working with FM and ComEd on a variety of short-, medium-, and long-term solutions. It is important to understand that this is far more complicated that just installing a generator.

In the immediate aftermath of the outage, leaks that led to switch failure were sealed. FM is now working with ComEd to upgrade the gear and its housing. This, and other electrical infrastructure projects already underway, will enhance the redundancy of power feeds to campus. This improved redundancy and switching capacity is only a necessary first step, but is not a sufficient strategy for improving the robustness of the electrical infrastructure.

Approaches to providing true emergency back-up power are complex and vary from building to building. Moreover, it isn’t practical to supply emergency power to all building systems, so we must identify “vital” equipment and how to distribute power to those systems—obviously freezers are a top priority. Working with FM, we will be seeking input from you about these priorities. It’s likely that a staged approach will necessary, as it may be faster and easier to provide backup power to some buildings (e.g. Tarry) than others.

Given the valuable materials held in freezers, we will be expanding backup power enabled freezer farm capacity—with the Dean’s office funding the build out of this new capacity. The McGaw basement is tied into NMH emergency generators which can cover for loss of power to other buildings. We’re creating additional space there where freezers with samples that don’t require frequent access can be located. We’ll also plan on buying a few emergency freezers that can be used for storage of critical items in emergencies.

What Can You Do?

No matter how much money and effort we invest, no building is 100% safe from infrastructure failures. In addition to the work being done at the campus and building levels, there several things you can do to protect expensive equipment and valuable reagents and samples. Equipment sensitive to power fluctuations should have UPS systems, since even in buildings with full backup power, switching power sources in an emergency may still cause brief interruptions and surges that can cause damage. Freezers can be equipped with CO₂ backup systems, since even in buildings with full backup power, freezing power sources in an emergency may still cause brief interruptions and surges that can cause damage. Freezers can also be equipped with auto-dialer alarms which will send phone messages in case of power failure or rise in temperature. Many of you already have such systems in place.

In the end, protecting our valuable research efforts is an ongoing project in which all elements of the University community have a role. The Dean’s Office will continue to reach out for input from the research community regarding needs and issues, and will continue to communicate with you as we work to resolve deficiencies and improve our systems. We welcome your input and feedback.

Please contact the FSM Office for Research with questions or concerns: (312) 503-1499
How long have you been at NU?
That question is actually hard for me to answer simply. I first worked at Northwestern in 1988-1989 as a night book shelver right here at the Galter Library. It was a part-time job, while my full time job was as a lab tech at Loyola’s Stritch School of Medicine. Then in 1994, I left Loyola and started working as a lab tech for Dr. Marsel Mesulam, who is the director of the Cognitive Neurology and Alzheimer’s Disease Center (CNADC) here at the Feinberg School. I was a neuroanatomy and immunohistochemistry technician. I performed whole-hemisphere sectioning of human brain and stained these sections for a number of normal and pathological markers. I took a couple of years off to open my own business (a record store), but came back to the CNADC in 1997. The CNADC tech position was a very cool job, but I realized that I couldn’t do it indefinitely, so I decided to attend library school while still working as a tech. Then, after completing library school while working full time for the CNADC, I started working here at the Galter Library in January of 2006.

Where are you from?
I was born in Indiana, but have lived in the Chicago area since completing my undergraduate degree in 1986.

What’s your educational background?
I have an undergraduate degree in biological psychology from Oberlin College (although the same course track is now called “neuroscience”). I received my master’s degree in library and information sciences from the University of Illinois in May of 2006. I have a fellowship from the National Library of Medicine for bioinformatics training, so I am enrolled in and in the process of completing a second master’s degree in computational biology and bioinformatics (CBB) here at Northwestern. Sadly, this program has been discontinued, and I will be one of the last students to receive this degree.

What is your role at the library?
I serve as liaison to most of the basic science departments here at Feinberg, and I also teach classes in bioinformatics tool selection and usage, scholarly publishing, and literature database searching. I have served on NUCATS and One Northwestern committees. I also teach some database searching and citation management classes to incoming graduate students in the integrated graduate and genetic counseling programs.

What’s a typical day like for you?
It’s definitely different from being a lab tech! I generally try to keep as much time open as I can to spend answering users’ questions. I work on updating user guides and lists of resources on the Galter web site. I have created a few new classes since coming to Galter in BLAST searching and other online bioinformatics resources, and I am creating online tutorials for bioinformatics tools. My role here is not to write algorithms for computational biology, but to assist researchers in selecting and using the tools that are already available to them. I am working on (Continued on page 5)

Ingenuity Pathways Analysis
Now Available at Galter Health Sciences Library

In response to researchers’ requests, Galter Library is now offering Ingenuity Pathways Analysis (IPA) to the Northwestern University research community.

For those unfamiliar with the software, the Galter Library web site describes IPA as an application that allows the user to explore and discover biomarkers, molecular processes, and networks through an interface that integrates scientific literature and molecular databases such as Entrez Gene and Gene Ontology. IPA allows the user to build their own pathway models with a range of interactive tools for modeling multiple types of relationships, and includes the ability to narrow in on species, tissue, or disease. IPA also provides quick data analysis, and the ability to share results and collaborate with colleagues.

Galter Library has purchased a license for three simultaneous users and is offering registration to any bioscience researcher within the Northwestern University community. In order to register, please visit [http://www.galter.northwestern.edu/Guides-and-Tutorials/Ingenuity-IPA-Guide/](http://www.galter.northwestern.edu/Guides-and-Tutorials/Ingenuity-IPA-Guide/).
a couple of projects with Simon Lin and Jared Flatow at the bioinformatics core here at the Feinberg School. Simon always has so many ideas of great projects that it's fun to work with that group.

Since I am also a graduate student, I spend time attending classes, and I also attend lab meetings with the laboratory of Rich Longnecker in microbiology/immunology. He is one of my advisors for my CBB master's degree. I really enjoy attending seminars and lab meetings so I can stay in touch with research at Northwestern. I love being able to come back to the library and find information that can answer questions that may arise at these meetings.

I also do “typical” library jobs such as working the reference desk and evaluating our printed collection for currency and quality.

Why did you choose to work here?
It seems that I am attracted to academia. Jim Brucker, a classmate of mine in library school, was already employed by Galter Library (and still is). He finished his library degree and was hired as instructional design librarian. He mentioned that Galter was planning to hire a bioinformatics and basic sciences specialist librarian and he recommended that I apply for the position. Since I already had quite a few years of working with some staff here at Feinberg through my work in the CNADC, the Galter Library administration thought that I might be a great fit for the job, since I had a familiarity with the research environment here.

What do you like/dislike about your job?
I really like being able to show someone how to find information in an efficient manner. Our clinical and research community here at Feinberg are good at information seeking, but there are always little tips and tricks that we can teach our users that will make their searches more satisfying. I love nucleotide and protein sequence and structural searches, so I’m happy when I get questions from users about how to select the proper parameters for sequence searches or how to find structure tools or genome browsing tools. If I provide a user with information or a resource that makes their research better or makes their life easier, then I feel like I’ve done a great thing and that I’m still involved and connected with biosciences research here at Northwestern.

The only thing I dislike about my job is that I wish more people knew how much the staff here at Galter can help them with literature searches, citations, and information management; and how much I can help them with their bioinformatics needs. If I don’t have an answer for users on how to approach a problem, I can direct them to the people who can help them.

Is there anything else you’d like to add?
If users want to contact me, they can access my staff liaison page at: http://www.galter.northwestern.edu/Using-the-Library/Pam-Shaw/
Student Profile: Luke Flores

Where is your hometown?
I was raised in Corpus Christi, Texas and graduated from W.B. Ray High School in 1999. The only thing to say about Corpus is that it is the hometown of Farrah Fawcett, Selena, and Eva Longoria. I guess the men from Corpus don’t typically amount to much.

What are your research interests?
It was at UTSA that I found my heart in my brain. I became fascinated in the inner workings of the mind, specifically how memories, feelings, and thoughts can exist in a network of cells. It amazed me how little we understood about such basic concepts as how a memory “exists” in your mind. At UTSA I worked in the laboratory of Dr. Joe Martinez, where I investigated methods for preventing relapse to methamphetamine self-administration in rats. Here at Northwestern University, I work with Dr. John Disterhoft. My dissertation project is investigating a role for the basal ganglia in memory, specifically memories that are thought to be “hippocampus-dependent.”

What exciting projects are you working on?
The basal ganglia are a group of nuclei that are known to be very important in the initiation and planning of coordinated motor movements. Much of our study into the basal ganglia have focused on motor behavior, and rightfully so, given that these nuclei are impaired in patients suffering from Parkinson’s and Huntington’s Disease, diseases in which the most striking features are deficits in motor behavior. But in both of these diseases, patients suffer from cognitive problems as well, sometimes even before the onset of motor deficits. It has only been recently that investigators have begun to appreciate the role that the basal ganglia play in memory. One memory task that we utilize in the Disterhoft laboratory is trace eyeblink conditioning, a form of Pavlovian conditioning that requires the hippocampus. The hippocampus has been appreciated as a vital memory center for decades, and is avidly studied by thousands of laboratories around the world. My research is demonstrating that the basal ganglia are just as important for this type of memory as the hippocampus, and should be studied with greater earnest as a memory center.

What attracted you to the NUIN program?
When I was interviewing for graduate programs, I had a hard time choosing between Northwestern and University of California – San Diego. It was the size and diverse research interests of the faculty here at Northwestern that impressed me. I applied to the NUIN program because I could choose to work with faculty on the Evanston campus, at Children’s Memorial, and on the Chicago campus. The recruiting trip was great and several members of the faculty, including my future PI, called and e-mailed me after my visit to convince me to come to Northwestern. Ultimately, I have been very satisfied with my training here at Northwestern.

What has been the best (or worst) experience so far?
There have certainly been ups and downs. There were times when my project simply wasn’t progressing, and I felt like I was treading water. But overall my experiences have been very positive. The best thing that has happened to me happened in this past year when I was awarded an NRSA to finish up my dissertation project. It made me feel like my hard work was paying off and that I might have a future in this business after all.

How would you describe the faculty at FSM?
I’d describe them as a wonderful combination of brilliant but very approachable. You can be great at what you do, but it is no good to the rest of the scientific community if you don’t want to share that with anyone else. As a student, it can sometimes be intimidating to speak to faculty (I remember in particular a couple of very tense interviews at Princeton that helped convince me that I did not belong there). I have never had a problem asking Feinberg School faculty for help or advice. Inter-departmental seminars have been just as illuminating as visiting speakers. This openness has been crucial for the development of my own projects and my growth as a researcher.

What are your plans for after graduation?
I plan to go into education, or public advocacy for better science funding and education.

ANIMAL RESEARCH CORNER

On Saturday January 17 at approximately 5 a.m., a sprinkler head burst in the Lurie Building on the first floor. Unfortunately, water from the burst sprinkler head traveled through the walls and interstitial spaces and flooded portions of the Lurie vivarium. The flood was discovered by facilities management and CCM staff were notified immediately. When staff members responded to the call, water was ankle deep in some areas. Everyone, including facilities management staff, chipped in to help clean up the water.

We were extremely fortunate that only very few animal mortalities occurred due to the flood and that the facility only suffered major damage in a few select areas. Only one room of rodents had to be relocated due to damages. The emergency evaluation team was in the day after the flood to assess the damage and set up a plan of action. Demolition and reconstruction teams were on site the following Monday to begin work and fix damaged areas. To date, the Lurie barrier (basement level) has been completely renovated and animals returned to their original housing locations. Renovations are still occurring on the conventional (sub-basement) level but do not affect any animal housing areas.

CCM would like to thank everyone for all of their hard work, patience, and understanding during the disaster and its aftermath. Facilities management is currently working on implementing a plan to ensure that a situation like this does not reoccur in the future. If you have any questions about the flood, please contact Mary Ann Carroll, barrier facility manager, either by phone at 312-503-3292 or by e-mail at m-carroll@northwestern.edu.
Multiple myeloma (MM), one of the commonest hematological malignancies, represents the malignant transformation of plasma cells. For many years the pathogenesis of MM was quite obscure, but over the past decade there has been progress based upon the characterization of consistent chromosomal translocations in MM involving the immunoglobulin heavy chain (IgH). These translocations implicate particular genes in the pathogenesis of myeloma. Multiple myeloma set domain (MMSET) gene was identified at the breakpoint of the t(4;14) translocation, present in 15-20 percent of multiple myeloma. MMSET has a SET domain previously identified in histone methyl transferases. We demonstrated that the MMSET protein is strikingly overexpressed in myeloma cells harboring the t(4;14) translocation. Our preliminary data indicate that MMSET has proprieties of a transcriptional cofactor, including nuclear localization, the ability to bind to sequence specific transcription factors, transcriptional cofactors and histone deacetylases. Furthermore we found that MMSET has histone methyl transferase activity, modifying histone H3 and H4. These data lead to our overarching hypothesis that aberrant overexpression of MMSET leads to deregulated gene expression in B cells, contributing to the pathogenesis of myeloma.

This award seeks to characterize the role of Nek3 serine-threonine kinase during the pathogenesis of breast cancer. Structure/ function relationships between Nek3 and the paxillin and Stat5 complexes will be examined. In addition, the in vivo effects of the loss of Nek3 will be explored in a newly developed knockout mouse model.
Upcoming Events

**CALL FOR ABSTRACTS - 5th Annual Lewis Landsberg Research Day**
Submission Deadline: Monday, March 16, 2009

The 5th Annual Lewis Landsberg Research Day is scheduled to be held on Thursday, April 2, 2009. This event is open to the research community who fall within one of the following categories: faculty; graduate students; MD-PhD (Medical Scientist) students; medical students; postdoctoral researchers and fellows; and clinical residents and fellows.

Abstracts may be submitted through the Research Day 2009 website at http://www.feinberg.northwestern.edu/research/research_day/2009

**Department of Dermatology Seminar Series**
“Genodermatoses Part II”
**Speaker:** Amy Paller, MD, Jonathan Dyer, MD
**Date:** Wednesday, March 18, 2009
**Time:** 8a.m.-1p.m.
**Location:** Feinberg Conference Center, 251 E. Huron Street, 3rd floor
**Contact:** Trish Gougis (312) 695-6837

**NUCATS**
“The Northwestern Medicine Enterprise Data Warehouse: A Resource for Providing Data to the Research Community”
**Date:** Friday, March 20, 2009
**Time:** Noon -1p.m.
**Location:** NMH Feinberg Pavillion 3rd Floor, Conference Rooms B & C
**Contact:** nucats-ed@northwestern.edu

**Feinberg Cardiovascular Research Institute Seminar Series**
“Intermediate Filaments: Major Elements of the Nucleo-and Cytoskeletal Networks of Healthy and Diseased Cells”
**Date:** Thursday, March 26, 2009
**Time:** 8-9:30a.m.
**Location:** 303 E. Superior Street, Lurie Building, Baldwin Auditorium
**Contact:** Feinberg Cardiovascular Research Institute—Donna Ray, 312-503-2296 or dir635@northwestern.edu

Funding Opportunities

**2010 McKnight Brain Disorders Awards**
*McKnight Endowment Fund for Neuroscience*
[www.mcknight.org/neuroscience](http://www.mcknight.org/neuroscience)

**Proposal Submission Deadline:** 4/1/2009

**Amount:** $300,000. Due to the current financial crisis, up to four awards, each providing $100,000 per year for three years, will be funded in 2010.

**Synopsis:** The McKnight Endowment Fund for Neuroscience supports innovative research designed to bring science closer to the day when diseases of the brain can be accurately diagnosed, prevented, and treated. To this end, the McKnight Neuroscience of Brain Disorders Award assists scientists working to apply the knowledge achieved through basic research to human brain disorders, particularly those that affect memory.

**Human Immunology Grants**
*Dana Foundation*

**Proposal Submission Deadline:** 5/12/2009

**Amount:** Each Dana Scholar will be eligible to receive up to $225,000 in support (which can include up to 10 percent for equipment; but the Foundation does not fund indirect costs), payable over a three-year period. Dana Scholar awards will be announced late in 2009. Please note that, due to financial constraints, selection will be extremely competitive and it is expected that fewer than 10 percent of applicants ultimately will receive funding.

**Synopsis:** The Dana Foundation will support promising new investigators who are beginning careers in patient-based immunology research as Dana Scholars. To be considered for a Dana Scholar award, a candidate should be a new faculty member carrying out independent research, e.g., postdoctoral fellow transitioning to a first faculty position, as instructor or assistant professor (with no more than one current R01 award). A scholar should be initiating or engaged in research in immunology that requires the study of patients or materials from patients. One of the areas of interest is the brain.

For more funding opportunities, visit: [www.feinberg.northwestern.edu/research/funding-opportunities/](http://www.feinberg.northwestern.edu/research/funding-opportunities/)

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**Event organizers are encouraged to submit calendar items on Plan-it Purple. For more events, visit [www.feinberg.northwestern.edu/research/calendar/](http://www.feinberg.northwestern.edu/research/calendar/).**