July 2008

FSM Research Newsletter

Feinberg School of Medicine Office for Research
Northwestern University

BUDDY PROGRAM REVEALS HUMAN SIDE OF DISEASE

The Cognitive Neurology and Alzheimer's Disease Center (CNADC) visionary "Buddy Program" continues to provide researchers and first-year medical students an opportunity to get to know patients with Alzheimer's disease in a non-clinical setting. The program provides researchers direct contact with Alzheimer's Disease patients, enabling them to gain first-hand experience with the disease and its effects on patients. The program, which celebrated its ten-year anniversary in 2007, has become a national model that has been successfully replicated at Boston University School of Medicine. Funding will soon be received from a local foundation to publish a curriculum and dissemination manual over the next year in an effort to expand the program to more medical schools; in addition to, schools of nursing and social work.

Harriet and Julie

"We began this program as a way to augment the experience for our first-year medical students," says Darby Morhardt, MSW, LCSW, who coordinates the program. She explains that the idea for the program came from a physician at the CNADC who had a patient who was a retired physician with early-stage Alzheimer's disease. Though he could no longer practice medicine, he was eager to use his knowledge and experience in some meaningful way. The CNADC physician suggested that the patient could serve as a mentor to an interested medical student. "And so, the Buddy Program was piloted and developed to provide first-year medical students hands-on experience with persons diagnosed in the early stage of Alzheimer's' disease or other forms of dementia. The program allows doctors and patients to get to know each other on a personal rather than a clinical level. The rationale behind this 'pairing' was that knowledge and attitudes regarding aging and dementia among medical students would improve as a result of their buddy experience. Additionally, our hope was that the patients involved would find this to be a positive experience. In fact, over the ten-plus years of the program we believe both of these initial objectives have been met."

Morhardt says the Buddy Program aims to: provide persons with dementia an opportunity for socialization and companionship; educate medical students about Alzheimer's disease and other dementias at the early stage of the illness; introduce medical students to research and practice opportunities in dementia-related fields; provide the opportunity for persons with Alzheimer's disease to share their experience with someone who will listen; and familiarize students with issues related to the daily care and support of persons with Alzheimer's disease and other dementias as well as the needs of families .

At the beginning of each academic year, the program recruits approximately 10 students, who will then participate in three hour -long orientation sessions. Patients are identified for possible participation in the program through the CNADC. "We identify individuals with early stage dementia who are able to understand the basic concept of the program, and who are willing to spend a minimum of time with the medical student each month. In addition, the patient must be free of any behavioral problems that would make it difficult to engage in an activity with the medical student, and must live within a geographic distance that makes visits convenient for them."

Morhardt adds that Feinberg School researchers are also offered the opportunity to participate in the Buddy Program. "Involvement in the Buddy Program is a great way to gain some practice experience in Alzheimer's disease and dementia. This can help them better understand the effect of these conditions on the patients outside the confines of the laboratory and the hospital. They see patients in the real world…their future work in the lab then may have more resonance and reward." In recent years, one researcher, when interviewed about her experience with the Buddy Program, noted that before this opportunity the closest she had even gotten to Alzheimer's disease was looking at the brain cells of mice with the disease under a microscope. Her 'buddy' showed her the human side of the disease. "And, I gained a cherished friend," she says.

Darby Morhardt, MSW, LCSW, Director of Education at CNADC

Students are required to commit five face-to-face hours per month to the Buddy Program. Four hours are devoted to time with their buddy, and the other hour is designated for monthly program meetings. Students are also permitted to observe clinical evaluations of their buddy, giving them an opportunity to observe neurological, neuropsychological, social work and/or psychiatric assessments.

Larry and Mike

After each one-on-one visit with their buddy, students are asked to write a summary of their experience, keeping a journal throughout the year. These reports briefly describe the activity, with notes about their buddy's mood and behavior as well as their own thoughts and feelings. "These journal entries have become the foundation for a qualitative analysis of the Buddy Program and provide information that is meaningful about the student's experience,"

…continue to page 5

In this issue:

MEET KIANG LIU, PHD

Professor and Associate Chair for Research, Department of Preventive Medicine

What are Your Research Interests?

My research focuses on cardiovascular epidemiology and the prevention of cardiovascular disease. Specifically, I have been the principal investigator of the Chicago field centers of two large studies—CARDIA and MESA—funded by the National Heart, Lung and Blood Institute. The findings of these longitudinal studies have important implications in the prevention of cardiovascular disease.

What are CARDIA and MESA?

CARDIA (Coronary Artery Risk Development in (Young) Adults) is a collaborative, longitudinal study of lifestyles and the evolution of risk factors for cardiovascular disease in young adults. Data have been collected at approximately two- to three-year intervals for 5,115 participants recruited at four centers, located in Chicago; Minneapolis; Birmingham, Alabama, and Oakland, California. These individuals ranged in age from 18 to 30 at baseline in 1985-1986, and were roughly evenly balanced by sex, race (black/white), age (18-24, 25-30) and education (high school or less, more than high school). Seven examinations (baseline, Year 2, Year 5, Year 7, Year 10, Year 15 and Year 20) have been completed. Repeated data collected from these participants over the twenty-year period include blood pressure measurements, blood chemistries, anthropometric measurements, complete medical histories, family histories, physical activity questionnaires, exercise treadmill tests, psychosocial data, alcohol questionnaires, smoking questionnaires, diet histories, pulmonary function tests, echocardiography measurements, coronary calcium measurements, and carotid intima media thickness measurements. In addition, there are more than 30 NIH-funded ancillary studies, of which the NU investigators serve as the PIs of seven. Currently the CARDIA study has been renewed for another five years (2008-13). The Year 25 exam will be held in 2010.

MESA (Multi-Ethnic Study of Atherosclerosis) is a longitudinal study of the characteristics of subclinical cardiovascular disease (disease detected non-invasively before it has produced clinical signs and symptoms) and risk factors that predict progression from subclinical to clinically cardiovascular disease, in a diverse population-based sample of 6,814 men and women aged 45-84. Approximately 39 percent of the cohort is White; 27 percent African-American; 22 percent Hispanic; and 12 percent Asian (of Chinese descent). The cohort was recruited from six Field Centers: Northwestern University; Columbia University, New York; Johns Hopkins University, Baltimore; UCLA, Los Angeles; University of Minnesota, Twin Cities; and Wake Forest University, Winston Salem. The cohort was characterized with respect to a variety of subclinical cardiovascular disease measures, including CT scans for coronary calcium, carotid ultrasound, endothelial function, ABI, cardiac MRI, and arterial compliance. Standard coronary risk factors, sociodemographic factors, lifestyle factors and psychosocial factors are also assessed. Blood samples are assayed for putative biochemical risk factors and stored for nested case-control studies. Also, DNA is extracted and lymphocytes immortalized for studying candidate genes and possibly genome-wide scanning. Four clinical examinations, 18 to 24 months apart, were performed. Participants are being followed for identification and characterization of cardiovascular disease events and interventions received. Currently, the study has been renewed for another seven years (2008-15). The fifth exam will be held in 2010. Similar to CARDIA, MESA has many ancillary studies; NU investigators serve as the PIs of some of them.

What are the goals of your research?

One of the CARDIA study's most important goals is to identify factors during young adulthood that may have an impact on subclinical or clinical disease in middle age. Our findings indicate that risk factor levels (even though they are not high clinically) in young adulthood are associated with subclinical atherosclerosis in middle age 20 years later and the relationships are stronger than the relationships between the concurrent risk factor levels and subclinical atherosclerosis. These findings suggest that the prevention of cardiovascular disease should begin at a young age. We will continue to pursue these research objectives.

As for the MESA study, we have demonstrated that the coronary calcium score is strongly associated with clinical cardiovascular events in different genders and ethnic groups. Also, our findings suggest that cardiac MRI can also identify people with a high risk of heart failure.

The two studies complement each other as well. One shared goal is to identity risk factors for cardiovascular disease and to refine the prevention strategies. Another is to use emerging imaging technology to identify high-risk people for treatment. Regarding newer objectives, in the near future we will be performing translational research in which we will examine the relationships of new biomarkers identified in basic science research to cardiovascular disease in these cohorts.

What challenges do you face?

The most difficult challenge of conducting a longitudinal study is to retain the participants. In the CARDIA study, we have to ensure that the participants continue to be interested in the study for 25 years or longer. The key factor is having great research staff members who can develop rapport with participants. We have been very lucky. For both the CARDIA and MESA studies, our retention rates are the highest among all centers.

CONGRATULATIONS TO...

Dr. Navdeep Chandel, PhD, Associate Professor in Medicine-Pulmonary, for being chosen as recipient of the American Lung Association Career Investigator Award. This is a top award in the Lung research community as most the past awardees become leaders the field. The title of his project is "Mitrochondial ROS Regulation of TGF-Beta Induced Gene Expression". The long term goals are related to understanding how mitochondria regulate signaling and the findings would have relevance for tissue fibrosis, development and cancer as TGF-beta has been implicated in each of these clinical problems.

Dr. Aleksandar Videnovic, MD, MSc, Assistant Professor of Neurology, who was selected for the Parkinson's Disease Foundation and American Academy of Neurology Clinician Scientists Development Award. This is a three year award designed to promote and support the development of an academic career of clinicians-investigators in the field of Neurology. The title of the awarded project is "Circadian rhythm and sleep / wake cycle in Parkinson's disease patients with excessive daytime somnolence". Sleep disturbances, including poor overnight sleep and excessive daytime somnolence are common problems of patients with Parkinson's Disease (PD). Disturbed circadian rhythms are known cause of sleep dysfunction in the general population, but have not been systematically studied in PD. This award will support the ground work for the study of chronobiology of Parkinson's disease. The grant was officially awarded at the 60th American Academy of Neurology Annual Meeting held in Chicago in April 2008.

ANIMAL RESEARCH CORNER

The Center for Comparative Medicine (CCM) and the Institutional Animal Care and Use Committee (IACUC) are currently working on standardizing operations and procedures through the development of several types of approved documents. All documents go through a peer review process and committee review prior to approval.

IACUC documents fall into two different categories: Approved Animal Procedures (AAPs) and Policies. AAPs are used to describe general animal procedures and are designed to allow the PI to reference the AAP rather than writing the entire procedure out in their animal study protocol. Policies establish the guidelines and rules at NU for certain activities related to animal care and use.

CCM documents fall into three different categories: Standard Operating Procedures (SOPs), Forms and Guides. SOPs are used to describe how a specified task is accomplished. Forms are used to describe how and when a specified form is used. Guides are used to establish a guideline for staff to follow for a certain procedure or situation.

IACUC AAPs and Policies may be found on the IACUC website at http://www.research.northwestern.edu/OPRS/acuc/ . CCM SOPs, Forms and Guides may be found on the CCM website at http://www.research.northwestern.edu/ccm/ . Both sites require the user to enter their NU Net ID and password to gain access. As documents are developed and approved, they will be posted on the relevant website.

STUDENT PROFILE: CORY SIMPSON

Medical Scientist Training Program (MSTP)

Cory joined the MSTP dual degree (MD-PhD) program in the fall of 2003. After the first two years of medical school, he joined the lab of Dr. Kathleen Green in the department of pathology to pursue his PhD. Cory is originally from Granite City, IL, and received his BA from Washington University in St. Louis, majoring in Biology, with a minor in Spanish. He is currently a Presidential Fellow of Northwestern.

What are your research interests?
In the Green Lab, we study cell-to-cell adhesion via organelles called desmosomes, which are targeted in various human diseases, many affecting the skin. My project is to define the developmental role of a specific desmosome component called Dsg1 in the epidermis. We grow a three-dimensional model of skin in the lab using primary human keratinocytes and study the effects of manipulating Dsg1. Our results indicate that Dsg1 is necessary for normal epidermal development, but interestingly not through its ability to mediate adhesion, but through novel signaling regulation.

What attracted you to the MD-PhD program at FSM?
My undergraduate research advisor encouraged me to look into MD-PhD programs, which would allow me to combine my desires to practice medicine and conduct laboratory research. I chose Northwestern because of strong MSTP support, cutting-edge research, friendly people, and an amazing location. I joined the Green Laboratory because it was a supportive environment offering excellent scientific training and an exciting research agenda.

What is the best part about being a graduate student?
The excitement of discovery, the satisfaction of an experiment that actually works, and the variety of learning modalities in research.

How would you describe the faculty at FSM?
I've had great experiences with the FSM faculty in the classroom and beyond. In addition to my own advisor, who is an outstanding and supportive mentor, I've found several other faculty members who are never too busy to answer a scientific question, lend a reagent, or give sincere career advice.

What are your interests outside of research?
I really enjoy traveling. Most recently I've been on two medical aid trips to Nicaragua and Guatemala and went to Japan in May for a conference. I also volunteer at the Community Health Clinic and serve as a translator for Hispanic patients. As well, I love running and am training for my second half marathon.

What are your plans after graduating?
Upon completing my PhD, I will finish medical school, then apply for residency. Dermatology would fit really well with my research interests, but I'm also considering pathology and oncology. Eventually, I hope to work at an academic medical center running a research lab, seeing patients, and teaching.

BIOINFORMATICS CONSULTING CORE

The bioinformatics consulting core provides computational support for microarray, proteomics, and sequencing studies, which includes statistical design, data storage and data analysis. In addition, the core supports grant writing and provides open source software distribution. The core works closely with the genomics core facility to ensure that users obtain efficient access to high quality services including analysis for emerging technologies such as next generation sequencing.

A few cases from the past year in the analysis of microarray, proteomics, methylation, and sequencing data are highlighted below.

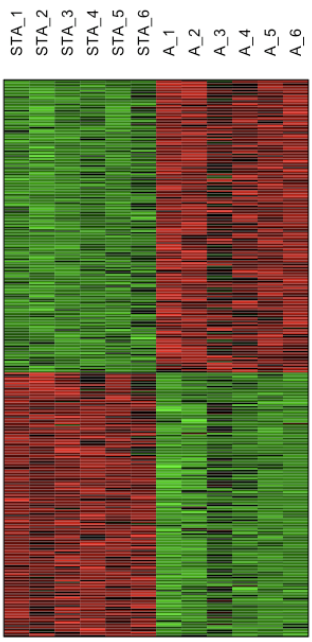


Figure 1.

Bioinformatics Analysis of Microarray Data

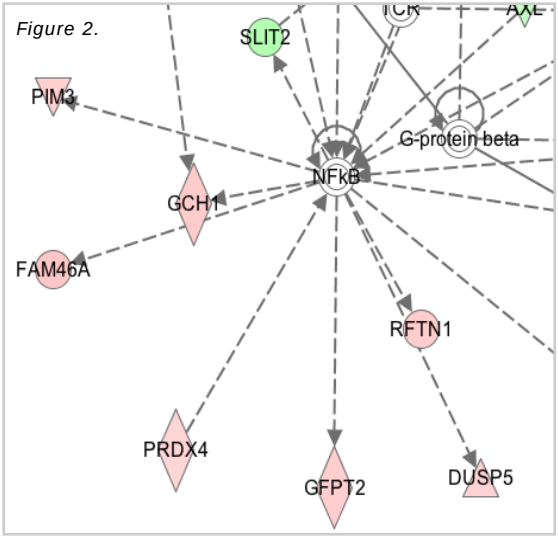
The bioinformatics core offers free consulting sessions jointly with the genomics core on the statistical design of experiments, which is key to the success of a microarray study. To accommodate the low-cost Illumina microarrays, a new data analysis pipeline was developed and validated (Bioinformatics 24:1547-1548, 2008). Figure 1 suggests a strong pattern of differential expression of aneurysm samples (A) vs. control (STA) by a statistical analysis of Illumina microarray data, which was developed in collaboration with Dr. Bernard Bendok (Surgery).

System Analysis of the Signaling Pathways

The bioinformatics core recently started offering pathway analysis with the Ingenuity database to interpret the biological implications of highthroughput studies.

In collaboration with Dr. Kelly Mayo (BMBCB), we identified a perturbed cell-signaling network (Figure 2). Microarray results from this study led to the discovery of activin regulation of estrogen receptor beta (JBC 282: 36755-36765, 2007).

Figure 2.

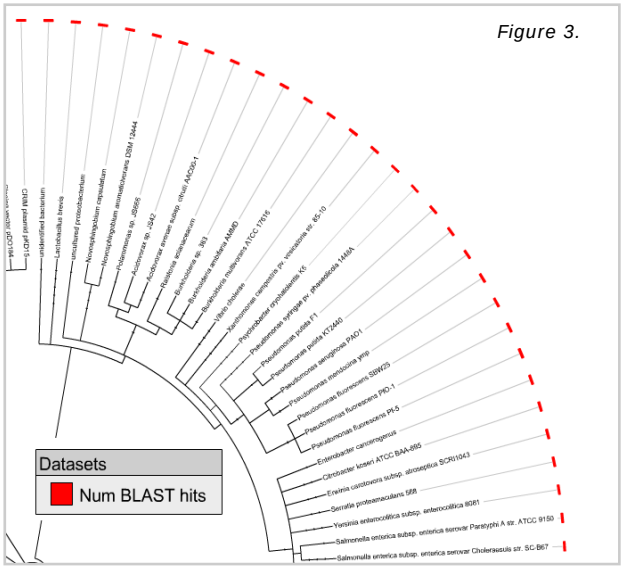


Analysis of Next Generation Sequencing Data

The bioinformatics core is actively planning and developing new capability of analyzing next generation sequencing data. We have implemented a pilot project to demonstrate the computational feasibility of scaling up BLAST queries. Figure 3 is the computational analysis of Next Generation Sequencing (NGS) data organized in collaboration with Dr. Anne Rowley (Pediatrics) to search for a pathogen.

The facility is supported by the Cancer Center Core grant and the Feinberg School of Medicine Dean's Office. NUBIC provides the Bioinformatics Consulting Core with access to the computing resources available in two NUBIC-affiliated in two data centers. Two physical locations provides a higher level of data security by backing up files and servers between the data centers. Physical redundancy also provides failover in case of a massive failure of one data center. One data center is currently in NUIT managed space. The other data center is on the 12th floor of 676 St Clair and is used primarily for backups, one cluster, and large file storage for the Core. The Abbott data center houses a 200 node CentOS cluster of 2.8Ghz quad core Xeon hardware. In February of 2006, the Department of Preventive Medicine moved their computing cluster to NUBIC and it is available to Core as well as Preventive Medicine users. Both clusters have been used for Core projects, by members of the Department of Endocrinology, and by Preventive Medicine for cluster analysis and other computationally intensive analytic methods. NUBIC also provides the Core with access to two Oracle database servers that each have several terabytes of disk storage and are used to house various datasets. The production Oracle server is located in the Abbott data center and the development server is in 676 St Clair.

Figure 3.



For more information, visit http://wiki.bioinformatics.northwestern.edu/index.php/Main_Page.

...continued from page 1

Morhardt says. Students are also tested pre- and post-program on their knowledge of and attitudes toward dementia. "On average, the student's knowledge/attitude scores do improve after the Buddy Program," Morhardt adds. "However we have found that the journal entries best reflect the impact of the program on the students. Their reflections indicate not only a growth in basic knowledge about Alzheimer's disease and related dementia but an increase in their capacity for empathy and compassion for persons with these conditions, and an understanding of the changes they experience and the challenges faced by them and their loved ones."

> "He is growing old with 'this Alzheimer's,' as he calls it, as gracefully as he can, and every time I leave I feel a combination of sadness for what he is going though, inspiration at how the family and he have rallied to live with such a debilitating disease, rather than fight it with anger and frustration, and awe that I have been so fortunate to have had this experience. I think my buddy continually believes that I have not learned much…and I continually reassure him that I have."
>
> -An excerpt from a journal entry made by a student about

Morhardt says many of the buddy pairs stay in contact long after the one-year official program participation ends. "I often hear about patients attending the weddings of their medical student buddies, for example. Some real friendships have been forged." She adds that many of the students who choose to participate in the Buddy Program are eyeing careers in relationship-oriented specialties such as internal medicine, family medicine, geriatrics or pediatrics. "But no matter what career path they follow, the experience with patients at the outset of medical school is invaluable in helping them put a human face on disease."

STAFF PROFILE: SHARON GREEN, MHA

Director, Program Development and Strategic Planning
Institute for Women's Health Research

Sharon has been at NU for almost 3 years. She spent 18 months as the Director of Special Population Initiatives at the Robert H. Lurie Comprehensive Cancer Center before moving into her current position. She has a Bachelor of Science in Medical Technology and a Master's Degree in Health Administration.

Where are you from? Both my husband and I are native Chicagoans. My husband is a professor, author and political pundit so we really enjoy living in the heart of the city with all its political tradition.

What do you do at IWHR? I oversee the administrative aspects of the Institute including prioritizing and developing the initiatives we need to accomplish in order to advance our mission of stimulating and encouraging increased women's health research at Northwestern.

What do you enjoy about your job? I get the opportunity to work with the entire spectrum of biomedical experts, and can appreciate what it takes to advance technology and therapeutics from the bench to the bedside. Having created the Office of Women's Health at the Illinois Department of Public health, I think there will be a lot of opportunities to partner with the public health community.

What do you do in your spare time? When we don't have time to travel far, we spend weekends at our cottage in the Indiana dunes where I enjoy gardening, , reading, swimming and hiking.

Tell us something interesting about yourself. While serving as the executive director of the Y-ME National Breast Cancer Organization, I was one of seven co-founders of the National Breast Cancer Coalition in Washington, DC. I designed and chaired their inaugural national grassroots campaign in 1991 that resulted in the first substantial increase in federal funding for breast cancer research from $90 million to $132 million. One of my key volunteers also uncovered the loophole that allowed us to convince Congress to spend some of the Department of Defense money on breast cancer research. This year, the federal research budget for breast cancer is over $400 million, including $210 million from the Pentagon budget.

SPONSORED AWARDS

Rohan Dharmakumar, PhD
Assistant Professor of Radiology

Project Title: 4D SSFP MRI for Detecting Functionally Important Coronary Artery Stenosis at Rest
Sponsor:
National Heart, Lung, and Blood Institute
Budget Period: 4/15/2008 – 3/31/2009
Amount: $371,356

Coronary artery disease (CAD) is the leading cause of death in the United States. The most common form of CAD leads to narrowing of the coronary arteries resulting in reduced blood flow and oxygen supplied to the heart muscle. Accurate early detection of these functional impairments may permit interventional revascularization procedures to re-establish blood flow to the affected regions. The absence of revascularization increases the risk of sudden cardiac death. We are developing a MRI-based method that has the potential to non-invasively detect CAD, guide initial treatment, and enable clinical management in patient populations with the disease.

Munshi Hidayatullah, MD
Assistant Professor of Medicine

Project Title: Fibrosis-Protease Cross-Talk Regulating Pancreatic Cancer Invasion
Sponsor: National Cancer Institute
Budget Period: 4/1/2008 – 1/31/2009
Amount: $273,644

The relatively high mortality resulting from pancreatic cancer is largely due to the fact that approximately 80% of patients present with locally invasive or metastatic disease at the time of diagnosis. Pancreatic cancer is frequently associated with an intense area of collagen-rich fibrosis surrounding the tumor known as the desmoplastic reaction. While the desmoplastic reaction is likely an important precursor to the development of local invasion, and perhaps metastases as well, the precise mechanisms that contribute to these processes are currently not well understood. The objective of this grant is to delineate the molecular mechanisms by which desmoplastic reaction contributes to pancreatic cancer progression.

Click here for a list of recent FSM sponsored awards

IN THE NEWS

Program enlists Austin residents to spread word on healthy living
http://www.chicagotribune.com/features/lifestyle/chi-0701-health-kitchen-tablejul01,0,2566580.story
Chicago Tribune - July 1st

During a brainstorming session on ways to implement health interventions for residents of Chicago's Austin neighborhood, someone tossed out an idea that struck a chord. How about inviting small groups of neighborhood residents to meetings in intimate settings similar to the homey way families swap stories around a kitchen table?

From that simple concept, Kitchen Table Interventions was born. Launched in January as a pilot project by Northwestern University in partnership with Westside Health Authority, Kitchen Table Interventions was designed to study urban health problems and help residents of the underserved West Side community live healthier lives.

Taking a novel approach, project staff trained everyday people to conduct research and teach other residents healthy behaviors.

Dr. Kevin Weiss, professor of clinical medicine at Northwestern and co-investigator of the project, said Kitchen Table Interventions shatters a lot of myths.

With this type of study, called community-based participatory research, the community gets an equal voice in what the research looks like, Weiss said. "My task was to work with the community and fashion [the intervention] in a way that a scientist could study," he said.

Tinnitus patients have a friend in zebrafish
Chicago Tribune - July 6th
http://www.chicagotribune.com/features/lifestyle/chi-0706-health-tinnitusjul06,0,6414849.story

Professor Ernest Moore hasn't named the zebrafish in his Northwestern University laboratory, where he researches drugs for tinnitus (ringing of the ears). But if he did, he says, he would name his favorite one Rose, after one of his mentors.

Moore should know. He has tinnitus himself, he says, thanks to his childhood hunting expeditions and his years in the military leading to too many guns fired too close to his ears.

Now, with a little help from his gilled buddies in the lab, Moore is one step closer to helping fellow tinnitus sufferers with a drug. Later this year, he plans to test his trial drugs on tinnitus patients through clinical trials with physicians. Some of the drugs, he notes, are already on the market for other purposes.

FUNDING OPPORTUNITIES

NIH Minority Access to Research Careers (MARC) Ancillary Training Activities (T36) *(Limited Submission)*
http://grants.nih.gov/grants/guide/pa-files/PAR-08-118.html
NU Submission Deadline: 7/18/2008
NIH Deadline for Proposals: 9/11/2008
Contact: Alden Chang @ alden-chang@northwestern.edu

NSF Science and Technology Centers: Integrative Partnerships *(Limited Submission)*
http://www.nsf.gov/pubs/2008/nsf08580/nsf08580.htm?govDel=USNSF_25
NU Submission Deadline: 8/1/2008
Contact: Alden Chang @ alden-chang@northwestern.edu

The Searle Funds at the Chicago Community Trust Searle Scholars Program *(Limited Submission)*
http://www.searlescholars.net/
NU Submission Deadline: 8/22/2008
Contact: Alden Chang @ alden-chang@northwestern.edu

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

UPCOMING EVENTS

Grantsmanship for the Research Professional
Summer 2008 / Spring 2009
July 17—18, 2008 / May 14—15, 2009
Wieboldt Hall, 339 E. Chicago Ave, Chicago Campus
Instructor: Holly Falk-Krzesinski
For more information:
http://scs.northwestern.edu/pdp/npdp/courses/?Program=PHILANTHROPY&Title=Grantsmanship+for+the+Research+Professional&Term=any
Offered by the School of Continuing Studies

Onco-Biotechnology - Research, Clinical and Business Summit
July 24—25, 2008
Hughes Auditorium, 303 E Superior St, Chicago Campus
For more information:
http://www.cancer.northwestern.edu/oncobiotech/index.cfm
Sponsored by Robert H. Lurie Comprehensive Cancer Center

Frontotemporal Dementia (FTD) And Primary Progressive Aphasia (PPA)
Caregiver and Professional Education Conference
August 11, 2008, 8:45 am - 4:30 pm
RSVP by August 1st
For more information:
http://www.brain.northwestern.edu/ppa/ppaftd.html
Sponsored by Cognitive Neurology and Alzheimer's Disease Center

Event organizers are encouraged to submit calendar items on Plan-it Purple. For more events, visit www.feinberg.northwestern.edu/research/calendar/.

Share your news with us!
Your feedback and suggestions are always welcomed!
Feinberg School of Medicine Office for Research
Email: fsm-research@northwestern.edu
Phone: 312-503-1499 Fax: 312-503-2790
www.feinberg.northwestern.edu/research/