READY AND ABLE

UB leads in disabilities research

Award Steinfield, professor of architecture and director of the Center for Inclusive Design and Environmental Access in the School of Architecture and Planning, sees research in disabilities and rehabilitation as a UB strength with unlimited potential. His center alone makes Buffalo a destination, and it is one of the university’s many efforts in disabilities-related studies. “There are some good things happening here at UB in this field,” he says.

Joseph Lane, director of the Center for Assistive Technology (CAT) in the School of Public Health and Health Professions, agrees, saying that UB should be better recognized for the depth and breadth of its disabilities research.

For the past 15 years, CAT has developed and commercialized assistive technologies for persons with functional impairments. The center has been consistently designated as a Rehabilitation Engineering Research Center funded by the U.S. Department of Education’s National Institute on Disability and Rehabilitation Research (NIDRR). These RECs, as they are known, use technology and engineering to produce ideas and products that benefit disabled populations. UB has hosted several over the years and is actively affiliated with others based at educational and nonprofit institutions around the country.

CAT’s most recent REC for technology transfer—called T2RECs—ended in 2009. It led to a $5 million NIDRR grant in 2009 to establish a Center on Knowledge Translation for Technology Transfer, which CAT calls KT4TT. The new center, the only one of its kind in the United States, will help CAT develop functional models of knowledge translation—the exchange of technology-based knowledge between laboratory and marketplace—to help researchers deliver assistive technologies to users.

CAT continues to partner with major Fortune 500 corporations to develop user-friendly consumer products, and collaborates with human service agencies across the country and in Canada. In the Center for Inclusive Design and Environmental Access, CAT maintains a P2 Center, a knowledge management system to facilitate technology-based research and dissemination.

Institute-wide, research in disabilities is conducted by 150 researchers in 12 disciplines. From 2005 to 2009, CAT researchers received $30 million in federal and non-profit grants. CAT’s researchers work with human service agencies across the country and in Canada.

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**CURRENT SUCCESSES**

Dear Colleagues,

This ninth issue of Navigator provides numerous examples of cutting-edge and socially relevant research being conducted at UB—of all of which coalesce around a number of our UB 2020 strategic strengths.

This issue reports on the remarkable success UB researchers have experienced to date with funding through the American Recovery and Reinvestment Act of 2009 (ARRA) with 69 new awards totaling in excess of $2.3 million received through October 31, 2009. Of particular note are the five NIH Challenge Grants in Health and Science Research received by UB investigators for innovative research that focuses on challenging biological, biomedical and behavioral research problems. All ARRA awards are funded competitively through peer review, which demonstrates that UB investigators are doing high-quality competitive work as determined by their scientific peers. These awards are part of the economic stimulus package approved by the White House and the U.S. Congress and are designed to promote local job creation and retention and enhance the economic vitality of the Western New York region.

The article on UB's strengths in disabilities research provides an overview of complementary and collaborative projects that span multiple disciplines—architecture, medicine, public health, biological sciences, computing, education and others—to improve the quality of life of special-needs populations. These are just a few examples of how UB research and scholarly work reaches and impacts others in meaningful ways.

We are pleased to highlight six new NSF CAREER awardees in the College of Arts and Sciences and the School of Engineering and Applied Sciences, bringing the number of active CAREER awards at UB to 22. The CAREER distinction recognizes outstanding excellence in both research and education of junior faculty early in their careers, and in testament to the caliber of UB's junior faculty, many of whom were newly recruited to UB.

We continue our focus on research at UB’s affiliating institutions with an interview with Donald Trump, MD, CEO of Roswell Park Cancer Institute. Long-standing collaboration between investigators at RPCI and UB builds upon strengths at both institutions and results in comprehensive cancer research that positively impacts patient care and cancer prevention.

I hope you share our excitement about UB's current successes as outlined in this issue of Navigator. As always, we welcome your comments and advice regarding this newsletter and research at UB.

Yours sincerely,

Jorge V. José, Dr. Sc.
Vice President for Research

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**MULTIDISCIPLINARY RESEARCH GRANT AWARDS OVER $2,000,000**

<table>
<thead>
<tr>
<th>Award Category</th>
<th>Principal Investigator</th>
<th>Co-Investigators</th>
<th>Funding Amount</th>
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<tr>
<td>National Institute of Diabetes, Digestive and Kidney Diseases</td>
<td>Frederick Sachs</td>
<td>National Heart, Lung and Blood Institute</td>
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<tr>
<td>Effect of Hypoxiogenic, Hypoglycemic, Insulin Sensitivity, Inflammation in Type 2 Diabetes and Obesity</td>
<td>Pashch Dandona</td>
<td>Sandipk Mohida, Hasan Gharani</td>
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<td>Cell Mechanics and Mechanical Transduction by Ion Channels</td>
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<td>National Science Foundation</td>
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**TWO MILLION**

**disabilities research**

**CONTINUED FROM PAGE 1**

Stefanfield and his colleagues use universal design principles to design products and built environments to be accessible for anyone, at any level of functional ability. According to Stefanfield, universal design principles are beginning to go mainstream.

Stefanfield is the co-principal investigator on the RERC on Universal Design and the Built Environment—the only RERC currently based at UB—and is collaborating with the Ontario Rehabilitation Technology Consortium and other U.S. partners in a second five-year cycle of funding.

Stefanfield is also participating in a five-year, $4.7 million RERC on Accessibilities Research and Information based at the Robotics Institute at Carnegie Mellon University. The RERC will develop user requirements to support the design and evaluation of vehicle features, boarding technologies and products, and design of transportation stops and stations.

Jeff Higginbotham, professor in the Department of Communicative Disorders and Sciences in the College of Arts and Sciences, directs the Center for Excellence in Augmented Communication and the center’s Communication and Assistive Device Laboratory. Augmentative and alternative communication (AAC) refers to methods used by persons with complex communication needs to communicate with one another, sometimes using specialized devices. The center is one of several research sites collaborating in the RERC for Communication Enhancement (RERC-CE) at Duke University.

Higginbotham and his colleagues use conversation analysis and computer interface design to study how individuals with amyotrophic lateral sclerosis, cerebral palsy and other communication problems can use augmentative and alternative communication devices to interact with others. “We are working on the development of new technologies to facilitate conversation, and to use the Internet as a vocabulary resource for AAC devices,” Higginbotham says.

John Stone, professor in the Department of Rehabilitation Science in the School of Public Health and Health Professions, directs the federally funded Center for International Rehabilitation Research Information and Exchange (CIRRIE). CIRRIE provides better access to rehabilitation research through its global classification system for disabilities, called the International Classification of Functioning, Disability and Health; cultural competence education; a database for rehabilitation practice; an international multilingual encyclopedia of Rehabilitation; and disability research exchange programs held in several countries.

In the Graduate School of Education, the Center on Rehabilitation Synergy (CRS) is directed by David Burganowski, who also runs the school’s rehabilitation counseling program. CRS oversees $16.25 million in funding to develop vocational rehabilitation and training programs for people with disabilities. That total includes a $4 million five-year grant from the U.S. Department of Education to provide technical assistance and continuing education to rehabilitation agencies in New York, New Jersey, U.S. Virgin Islands and Puerto Rico. Since the center was created in 2004, Burganowski and his staff have consulted with Steinfeld, Lane and Stone on several projects. This fall, opening yet another front to the field, the Center for Disability Studies was established in the College of Arts and Sciences with funding from UB and People Inc., a Western New York special-needs agency. The funds will support visiting faculty or postdocs who will teach a new course on disabilities scholarship at UB, develop programming at People Inc's Museum of Disability and help organize the agency’s disability film festival, held annually in Buffalo.

David Gerber, UB Distinguished Professor in the Department of History and center director, says the center’s mission is to nurture and promote scholarly inquiries into disabilities using multidisciplinary perspectives in such fields as law, history, language and literature, sociology and other social sciences and humanities disciplines. “There are just a few examples of disability and rehabilitation research at UB; there are more individual projects and interdisciplinary work groups that tap faculty in such areas as psychology, medicine, engineering, occupational and physical therapy, and social work—opening up new opportunities for positive impact on all populations, disabled or not.”

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**Caplan film premiers at Lincoln Center**

Emmy Award-winning artist and filmmaker Elliott Caplan, professor of media study and director of the Center for the Moving Image (CMI) at UB, has made an 18-hour film, "15 Days of Dance," to document the creative evolution of "Ghost Light," a 2007 ballet choreographed for dancers from the American Ballet Theatre. Caplan's new work documents the making of the ballet was funded through the Robert and Alcon Foundation and the Manhattan Institute.

The performance was commissioned by the CMI as a gift from the City of Buffalo to the people of New Orleans following Hurricane Katrina. Caplan’s new work will be screened in October at Lincoln Center in New York City. Screenings of subsequent installments will be shown Dec. 17, Feb. 11 and March 8 at the New York Public Library for the Performing Arts in Lincoln Center.

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UB receives prestigious research accreditations

The University at Buffalo has earned full accreditation from the Association for the Accreditation of Human Research Protection Programs (AAHRPP), a prestigious national organization that assures the ethics of research on human subjects.

The distinction, which took effect on Sept. 10, puts UB into an elite group of 42 institutions with AAHRPP and AAALAC accreditations. Only 42 institutions in the U.S. have received both AAHRPP and AAALAC accreditations.

"With this accreditation, UB has achieved the 'gold seal of approval' for our Human Research Protection Program and the institutional review boards (IRBs) involved in the review of all of the university's 1,700 research protocols," said Jorge V. José, vice president for research. It means that an objective third party has evaluated UB's program and said that it exceeds federal regulations and meets best-practices criteria.

José added that the accreditation does not require any significant changes by faculty conducting research with human subjects.

According to AAHRPP, accreditation indicates that an institution has provided tangible evidence of its commitment to scientifically and ethically sound research and continuous improvement in policies, procedures and practices concerning human research subjects.

In attaining the nation's highest level of accreditation for human research, UB makes itself more attractive to research funding organizations, from federal agencies to the private sector, José said.

While AAHRPP accreditation is entirely voluntary, it is becoming increasingly desirable; so far, at least one major pharmaceutical corporation requires that its subcontractors be accredited, and federal funding agencies including the National Institutes of Health also are said to be considering the possibility of making AAHRPP accreditation a prerequisite for receiving grants.

"The decision to target AAHRPP accreditation was the result of UB's forward-looking vision as expressed in the UB 2020 planning process," José said. “We took a strategic look at where we wanted to be in the future and we committed the necessary resources. We did it because we felt this was the right thing for the institution.”

The process of accreditation for UB took more than three years and produced an 878-page application submitted in 2008. An intensive three-day site visit followed in May, in which AAHRPP site visitors from peer institutions met with 80 UB administrators, including President John B. Simpson, Provost Satish K. Tripathi, IRB members, and research faculty and staff who conduct research with human subjects.

“Our staff and faculty at UB worked on this over and above their regular duties,” José said.

UB also was recently reaccredited, without any issues to remedy, by AAALAC, the Association for the Assessment and Accreditation of Laboratory Animal Care International, for protection of animals used in research.
not only meet the goal of stimulating scientific inquiry, but also to use a mechanism to stimulate the local economy through new hires and purchases,” says Jean Wactawski-Wende, vice provost for strategic initiatives and principal investigator on one of the federally funded projects.

The five UB Challenge Grant awardees will receive funding ranging from just over $400,000 to just under $1 million: Robert Rychtarik, senior researcher at the National Research Institute on Addictions (NIAA), along with institute researchers Neil Mccollum and Christian Barrick, received $994,778 to design and conduct a pilot clinical trial on an Internet-based training program to help women cope with a partner’s drinking problem. Nearly one in 20 adult women in the U.S. is married to or lives with an alcoholic or problem drinking partner. The Internet-based coping skills training may help remove social, economic and psychological barriers that can prevent individuals from seeking help in traditional treatment settings, and lead to their improved health, less drinking by their partner and fewer negative effects on the child.

Jerome Roth, professor and associate chair of social and preventive medicine, received $954,397 to study whether inflammatory biomarkers such as cytokines—proteins that help regulate the immune system—are found in saliva in levels correlating with amounts in blood. If so, cytokines, with high levels of some indicative of poor health, could be measured using a non-invasive saliva test instead of a blood test. The project team includes colleagues in the School of Dental Medicine (Robert Genco, Frank Scannapieco) and the School of Public Health and Health Professions (Christopher Andrews, Richard Brown and Michael Lekson), as well as partners at Boston University. The researchers will also explore the extent to which amounts of these biomarkers predict the onset and progression of periodontal disease and osteoporotic bone loss.

Paul Stasiwicz, a RIA senior research scientist, received $757,330 to examine cognitive behavioral therapy, a treatment that has shown success in reducing alcohol dependence. Besides looking at the therapy’s impact on users and the use of coping skills that prevent ongoing alcohol dependence, Stasiwicz and institute researcher Clara Bradizza will investigate its effects on four mechanisms hypothesized to reduce dependence: increasing self-confidence; reducing the positive expectancies of drinking; strengthening the therapeutic alliance between doctor and patient; and reducing negative emotional states that can deter successful treatment.

Deborah Waldrop, associate professor of social work, received $451,157 to lead a study that will explore how, when and with whom older cancer patients communicate their concerns and needs, and how they decide to use services such as home care and hospice. Co-investigators include Mary Ann Meeker from the School of Nursing and a doctor from the University of Colorado’s Health Sciences Center. Among other objectives, the research will seek to identify differences in decision-making between individuals suffering from different types of cancer who enroll in hospice and those who do not.

Jerome Roth, professor of pharmacology and toxicology, received $426,671 to head a study examining the role of the parkin gene in regulating mammalian neurotoxicity, a syndrome resembling Parkinson’s disease. Mutations in the parkin gene, a protein involved in the degradation of a variety of proteins, have been shown to lead early onset of Parkinson’s disease.

Roth’s preliminary evidence has demonstrated that such mutations may also be linked to increased susceptibility to developing mammalian poisoning. His new study could help explain why exposure to high levels of mammalian can predispose an individual to developing Parkinson’s disease.

 ix University at Buffalo scientists and engineers have won 2009 National Science Foundation CAREER awards, the foundation’s most prestigious award for junior investigators, which recognizes and supports the early career-development activities of teacher-scholars who, according to the NSF description of the program, “exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.”

 Soubaji Banerjee, assistant professor of chemistry, will study early transition metal oxides such as vanadium oxides. A major focus is to push this phase transition closer to room temperature so that this material can be used in “smart windows” that change color depending on the outside temperature and as transistors for next-generation computer chips. Another focus involves trapping single molecules of vanadium oxides, thousands of the size of a human hair, within device structures to measure individual conductivity.

Jason Corso, assistant professor of computer science and engineering, will develop better mathematical models and computational methods of representing and searching content in images and videos. The goal is to turn the phrases that people use to describe images into codes that computers can understand. The project will include an online public database, to which people can contribute descriptions of images; those descriptions will help Corso develop better computer models and codes for accessing those images. Applications include medical imaging, search engine tools and homeland security, as well as consumer tools for organizing online photo albums.

Sambandamurthy Ganapathy, assistant professor of physics, will conduct research to better understand the physics of quantum phase transitions in superconducting nanowires. The research may lead to greater control in the engineering of the microstructure and properties of novel tunable materials.

Atri Rudra, assistant professor of computer science and engineering, will study efficient techniques for computing approximate solutions to problems involving very large amounts of data, especially for handling the increasing number of errors that will occur as we pack more data into physical media. Rudra will also develop algorithms that efficiently handle large data with limited resources, and pricing algorithms that process data controlled by agents who might game the system for their selfish gains.

Jessica Corso, corresponding investigator; Jui-Chun Jen, Computer Science and Engineering; David Fidler, Social and Preventive Medicine; and the Cheektowaga Central School District with faculty and staff from the Western New York School Districts, including the Buffalo Public Schools, to introduce K-16 students to new science and technology curricula in a variety of cutting-edge fields.

Drugs Nanoscale Technological Innovations & Nanotechnologies for Drug Delivery, Photonic and Genomic Applications.

The five UB Challenge Grants ranged from $400,000 to $1 million.
findings

That bites

A new UB study has challenged the commonly held belief in forensic science that bite marks are a foolproof method for identifying perpetrators. Using dental models, photographic software and human cadavers, a team led by Raymond G. Miller, a pioneer in the study of bitemark identification, has shown that bitemarks are not as reliable as DNA identification.

Miller, who is also a professor of health behavior and the director of the School of Public Health and Health Professions and the Research Institute on Addictions, said that bitemarks are not as reliable as DNA identification because the alignment of teeth, shape of jaws and size of teeth can vary. Miller said that the study, which is currently in press in the journal *Journal of Forensic Science*, found that when dental alignments were similar, it was difficult to distinguish which set of teeth made the bite. "Bitemark identification is not as reliable as DNA identification," said Miller.

Bad habits

Gregory G. Hamish, assistant professor of health behavior, and colleagues in the School of Public Health and Health Professions and the Research Institute on Addictions recently published results of a seven-year follow-up study on substance use, part of an ongoing nine-year longitudinal study of newly married couples. In couples married seven years where drinking or smoking habits were similar, the study found that both partners remained relatively satisfied with their marriage. Dissatisfaction appeared when there was a discrepancy between the spouses' habits and relationships deteriorated further when one spouse indulged excessively in both alcohol and smoking.

Chilling evidence

Jason P. Brindu, assistant professor of geology, and colleagues from UB, the University of Alberta, the University of Massachusetts, Queens University and the University of Colorado have published a study in the journal *Journal of Paleontology* that is the first to date of how warming variations at an Arctic lake over the past 200,000 years have changed its ecology. By retrieving and analyzing sediments from the frozen lake on Baffin Island, part of the Canadian Arctic Archipelago, Brindu's team also found evidence of unprecedented warming taking place after the midpoint of the 20th century, indicating that current climate change may not simply be a natural variation.

Wild thoughts

In an article published in September in the journal *Trends in Cognitive Science*, J. David Smith, professor in the Department of Psychology and the Center for Cognitive Sciences and a pioneer in the study of metacognition in nonhuman animals, reviews the growing evidence that certain animal species—dolphins and certain monkeys among them—share functional parallels with human conscious metacognition.

Rational drugs

Matthew Disney, assistant professor of chemistry, and other UB researchers have published two papers this year in leading chemistry journals on their work with rational drug design to synthesize small, cell-permeable molecules that are effective in vitro against two common types of dystrophy—a major step forward in a multi-year effort to develop a chemical code that would enable rational design of binders to any RNA structure. The results have implications for a possible cure for muscular dystrophy, for which there is currently no cure and other similar RNA-mediated disorders.

Donald Trump, CEO of Roswell Park Cancer Institute, discusses RPCI's new work in cancer research and long-standing collaboration with UB.

Q. What are Roswell Park's research strengths?
A. Our research is organized around six specific programs, set out in our National Cancer Institute (NCI) Comprehensive Cancer Center Grant: cancer immunology and immunotherapy; cancer prevention and population sciences; cell stress biology; and genitourinary cancer. Strengths in each program include work at the basic level, as well as a commitment to translate these basic discoveries into clinical and population-based strategies to reduce cancer incidence and improve cancer therapy.

Q. How would you describe the history of collaboration between RPCI and UB?
A. The long history of Roswell Park Cancer Institute–UB collaboration began with the founding of the cancer research laboratory of Dr. Roswell Park, a UB professor of surgery. In 1898, that laboratory has grown to become the Roswell Park Cancer Institute, one of the very first institutes designated by the National Cancer Institute as a “cancer center” in 1974, and a designated NCI center ever since. The institute received its best review ever in 2008 when it was awarded its most recent five-year renewal. Since its inception, most Roswell Park faculty have held UB faculty appointments, and numerous research projects have emerged; most recently, in biostatistics, genetics and epidemiology, population science and stem cell research.

Q. What are some notable collaborations between UB and RPCI?
A. I am extremely proud of collaboration in biostatistics led by Alan Hutson. Hutson has developed a very strong biostatistics department at Roswell Park in his joint role as chair of biostatistics at both institutions. Hutson and his colleagues conduct innovative research in statistical techniques and also provide strong collaboration with UB's Department of Social and Preventive Medicine. Collaborations are leading to new understanding of important strategies for cancer prevention (e.g., smoking cessation and tobacco control), as well as exciting research delineating new approaches to cancer risk factors using molecular epidemiologic techniques. The genetics collaborations between our two institutions are strong and facilitate the discovery of new disease-associated genes and potential new therapeutic targets.

Q. Where would you like to focus RPCI's research in the future?
A. Roswell Park faculty and staff have recently completed a robust strategic planning process. This faculty-wide exercise has defined three major areas of research focus for the next 10 years. Our focus on cancer prevention and treatment. We are defining new targets in tumor or normal host cells. We also study the interaction of the microenvironment (blood vessels, immune and inflammatory cells, specific organs) in the host where a tumor develops and ways that manipulation of that environment can inhibit cancer development and growth. And finally, we are looking at the ways in which an individual's or group's behavior modifies the risk of cancer, as well as the manner in which cancer progresses.

UB helps conduct first shake-test of port container cranes

UB’s Structural Engineering and Earthquake Simulation Laboratory (SEESL) took center stage in December, 2008, when a team of civil engineering researchers from Georgia Tech conducted the first test in the world to shake and eventually collapse a scale model of container cranes on one of the laboratory’s high-performance earthquake simulators. Earthquake damage sustained by container cranes, which are used to load and unload cargo from ships at ports around the world, causes major economic losses and can slow goods disaster recovery. The project will develop seismic design guidelines so that crane-type structures can be designed or retrofitted to resist such damage. The tests are part of SEESL’s participation in the National Science Foundation’s George E. Brown Jr. Network for Earthquake Engineering Simulation (NEES) program. UB NEES is a key equipment site of this “collaboratory,” which allows earthquake engineers and students across the U.S. to share resources, collaborate on testing, and exploit new computational technologies.

International pharmacy program expands its mission with Fogarty grant

A collaborative pharmacy exchange program between UB’s HIV Clinical Pharmacology Research Program in the School of Pharmacy and Pharmaceutical Sciences and the University of Zimbabwe recently received its first $1.5 million National Institutes of Health Fogarty International Center grant from NIH’s program for funding international research. The UB-UZ program, which is also part of a $7.6 million, seven-year grant from the National Institute on Drug Abuse, offers growing evidence that such programs can enable rational design of new and improved drugs, and also provide strong training in HIV/AIDS research capacity and patient access to antiretrovirals. Gene D. Morse, professor of pharmacy, helps run the program, which received supplemental American Recovery and Reinvestment Act (ARRA) funding in September. The additional funding will help the training program expand to include technology transfer and laboratory facility growth, and eventually develop a new laboratory at the University of Zimbabwe that will train clinical pharmacologists in other southern African countries.