



alternatives to Bariatric Surgery

BY
LOIS
BAKER

Severe obesity treatments focus of \$5 million study

BlueCross BlueShield of Western New York and the University at Buffalo School of Public Health and Health Professions have announced a five-year research and treatment program for the severely obese that will study the effects of weight-loss alternatives to gastric bypass surgery.

THE \$5 MILLION PROGRAM is a landmark effort to stem the public-health obesity crisis. According to the Centers for Disease Control and Prevention, the annual cost of obesity in the United States is \$117 billion, including health-care expenses and lost productivity. An estimated \$4.5 billion was spent on gastric bypass surgery in 2005 alone, a 1,000 percent increase over 1995.

The treatment and research program, to be conducted by UB researchers, will be the first of its kind to use and assess proven scientific methods for treating the severely obese, defined as being those who are approximately 100 pounds or more over ideal weight. Participants will be monitored in one of four different programs. Each will use various combinations of behavior modification and lifestyle changes, meal replacement, counseling and medication.

The program, announced in March at a press conference at the university, was hailed by UB President John B. Simpson, PhD, as a hallmark collaboration between two institutions deeply concerned about the community's health and welfare.

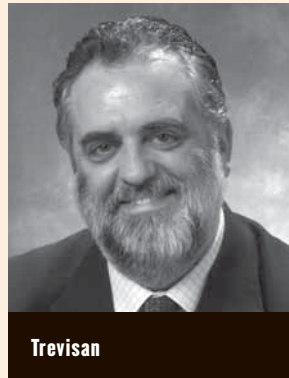
"The U.S. Surgeon General calls obesity 'the terror within' and has issued a call to action," added Alphonso O'Neil-White, president and chief executive officer of BlueCross BlueShield of Western New York. "BlueCross BlueShield's investment with the University at Buffalo will generate scientific evidence to develop a gold standard, best practices to treat the severely obese. This research initiative is necessary and is urgent, because the costs to our society and our economy—\$117 billion a year and growing—are far too great."

The study, to be conducted in the Center for Preventive Medicine in the UB School of Public Health and Health Professions, will involve 280 BlueCross BlueShield subscribers who will be divided into four groups, each of which will follow a different nonsurgical regimen for treating obesity.

At the end of the study, the outcomes and costs of medical care of the groups will be compared, as well as compared with those of a population of patients who have undergone bariatric gastric-bypass surgery.

Maurizio Trevisan, MD, dean of the UB School of Public Health and Health Professions and a coinvestigator on the study, called it "a great example of what can be achieved through collaboration among institutions in Western New York."

Michael F. Noe, MD, UB clinical professor of social and preventive medicine and associate dean for community relations and clinical affairs, is principal investigator on the study.



Trevisan

"More than 4.7 percent of the adult population in the U.S. is seriously obese and at risk for the major complications of that condition," explained Noe.

"While many meet the criteria for bariatric surgery and a growing number of procedures are being performed annually, surgical management is not without its complications and, for various reasons, is not an attractive option for many people or not available to them.

"It's essential that alternative, nonsurgical approaches to help people who are severely overweight be evaluated," he added, "and we need to determine if these new approaches are safe, doable and cost-effective. We think this study will provide some definitive answers."

Noe's coinvestigators, in addition to Trevisan, are Leonard Epstein, PhD, UB professor of pediatrics and a leading authority on obesity; John Leddy, MD, UB associate professor of clinical orthopaedics, and Jeffrey Lackner, PsyD, UB assistant professor of medicine and a specialist in behavioral medicine. Cheryl Kennedy is project director.

To learn more about the study and its methodology, go to the UB News Services site at www.buffalo.edu/news/ and search "obesity." **BP**



Back in the Flow

BY
LOIS
BAKER

Two major grants support heart research at UB

Scientists in UB's Center for Research in Cardiovascular Medicine have received two grants from the National Heart Lung and Blood Institute (NHLBI) to develop strategies aimed at reversing a heart dysfunction called "hibernating myocardium," which can cause disabling heart failure and sudden death.



PHOTO BY DOUG LEVINE

“Identifying the basic mechanisms responsible for incomplete functional recovery after revascularization hopefully will lead to new therapies that will improve the outlook and symptoms of these patients who are at high risk for adverse cardiovascular events.”

—John Canty, MD '75

The study is headed by Te-Chung Lee, PhD, associate professor of biochemistry and a specialist in stem cell biology.

Lee and colleagues will use the center's swine model to investigate whether transplanting the model's own bone marrow mesenchymal stem cells

The second phase of the project will involve injecting the stem cells into swine with hibernating myocardium. The researchers will track the cells' progress, evaluate their feasibility, and determine if cells engineering for enhanced survival, blood vessel regeneration and "homing potential" (the tendency to migrate properly to the heart rather than elsewhere) can better improve blood flow and tissue function in hibernating myocardium. **BP**

Additional investigators involved in the \$2.5 million study are Lee; Alan D. Hutson, PhD, professor and chair of the UB Department of Biostatistics; Jun Qu, PhD, research assistant professor of pharmaceuticals; and Michael D.

Banas, MD, research assistant professor of medicine.

Kenneth Blumenthal, PhD, professor and chair of the UB Department of Biochemistry, and Robert Straubinger, PhD, associate professor of pharmaceuticals, will serve as study consultants.

Additional investigators on the \$1.98 million study are Canty and Gen Suzuki, MD, PhD, research assistant professor in the Department of Medicine and the Center for Research in Cardiovascular Medicine.

HIBERNATING MYOCARDIUM is a condition in which heart cells (myocytes) that have experienced reduced blood flow over an extended period of time due to narrowed coronary arteries adapt to this deprivation by down-regulating metabolism while remaining functionally viable.

Previous work employing the center's novel swine model of hibernating myocardium has shown that, while restoring blood flow to these "hibernating" regions improves function and a patient's prognosis, cells in the left ventricle (the heart's main pumping chamber) often remain chronically dysfunctional and do not return to normal. The reasons for this remain unclear, researchers say, but in most circumstances do not appear to be caused by replacement with scar tissue.

In one of the grants, totaling \$2.5 million over five years, the UB researchers will seek to determine if the metabolic changes that myocytes undergo in order to remain viable during hibernation limit their long-term ability to recover fully after revascularization.

Led by John M. Canty, MD '75, Albert and Elizabeth Rekate Chair in Cardiovascular Disease and chief of the Division of Cardiovascular Medicine, the researchers will undertake concurrent physiological, proteomic and mitochondrial functional studies in the swine model that will be translatable to humans. As part of the study, they will use proteomic profiling to identify candidate mitochondrial proteins in the swine with established viable dysfunctional myocardium that do not have significant cardiac scar tissue.

"These protein studies will be coupled with assays of mitochondrial respiration and of the activity of specific

enzymes in the swine model—work that relies on the state-of-the art proteomic research facilities and mass spectrometry at UB," says Canty, who also heads the Cardiovascular Disease Group of the New York State Center of Excellence in Bioinformatics and Life Sciences at UB.

"By using therapies similar to those that are used clinically in patients, such as angioplasty and adenoviral gene transfer to over-express growth factors in the heart, we can identify how changes in the molecular pathways responsible for the adaptation to decreased blood flow can be reversed more completely. The ultimate goal of manipulating these pathways will be to restore full contractile function."

Areas of hibernating myocardium are common in patients with heart failure arising from coronary artery disease, Canty notes. "Determining how this impacts prognosis is the focus of the UB Cardiovascular Center's PAREPET (Prediction of ARrhythmic Events with Positron Emission Tomography) clinical trial, which also is funded by NHLBI.

"Identifying the basic mechanisms responsible for incomplete functional recovery after revascularization hopefully will lead to new therapies that will improve the outlook and symptoms of these patients who are at high risk for adverse cardiovascular events," says Canty.

Adult Stem Cells to Target Damaged Hearts

Under the second grant, which totals \$1.98 million, researchers in the center will investigate the potential of bone marrow-derived adult stem cells to treat hibernating myocardium.

(MSC)—cells that have the capacity to develop into blood vessels, as well as other types of tissues—into the downregulated tissue can change the myocardial adaptive responses and improve the function of the hibernating myocardium.

"My colleagues and I already have carried out initial stem-cell transplantation studies with promising results," says Lee. "Additional studies will be needed to determine whether and how stem cell populations isolated from aged animals may be used.

"In the long term, the translation between the MSC-based therapy in the porcine hibernating myocardium and regenerative medicine for humans with chronic coronary artery disease will lead to optimized MSC therapeutics that can be of clinical value in managing aging and curing disease," he says.

The research will be carried out in two phases. During the first phase, investigators will conduct extensive studies of the characteristics and potential of the targeted stem cells, including research on the influence of aging on the potency of MSCs (hibernating myocardium typically does not occur in young persons).

"If aging indeed impairs the function of these adult stem cells," says Lee, "genetic and tissue engineering might be used to boost the competency of aged MSCs."

He notes also that mesenchymal stem cells do not appear to generate a strong immune response. "If this characteristic is proven rigorously, and if we determine how these stem cells differentiate into cells for specific 'jobs,' it might provide the basis for 'off-the-shelf' use of these stem cells in future therapeutic applications," he says.

“If this characteristic is proven rigorously, and if we determine how these stem cells differentiate into cells for specific ‘jobs,’ it might provide the basis for ‘off-the-shelf’ use of these stem cells in future therapeutic applications.”

—Te-Chung Lee, PhD

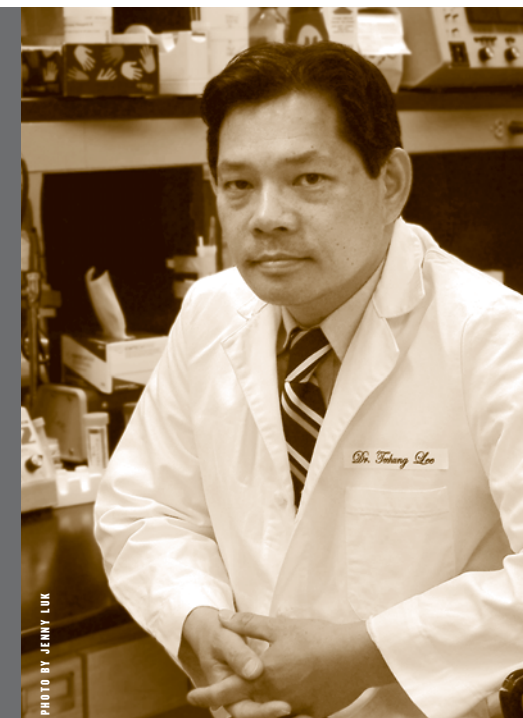


PHOTO BY JENNY LUK



UB's New York State Center of Excellence in Bioinformatics and Life Sciences

Center of Excellence Opens

Marks a milestone for transformation of Buffalo economy

By JOHN DELLA CONTRADA

CREATION OF A LIFE-SCIENCES INDUSTRY AND ECONOMY FOR BUFFALO NIAGARA TOOK A HISTORIC STEP FORWARD WITH THE GRAND OPENING OF UB'S NEW YORK STATE CENTER OF EXCELLENCE IN BIOINFORMATICS AND LIFE SCIENCES ON JUNE 2, 2006.

ALSO CELEBRATING ITS GRAND OPENING THAT DAY WAS ROSWELL PARK CANCER INSTITUTE'S CENTER FOR GENETICS AND PHARMACOLOGY, WHICH ADJOINS THE CENTER OF EXCELLENCE.

THE OPENING of the two centers marked an important milestone in Buffalo's transformation from postindustrial, rust-belt city into a major hub for life-sciences research and spin-off biotechnology companies.

Governor George E. Pataki, who proposed the creation of the Center of Excellence in 2001 as part of a plan to jump-start the New York State economy through creation of high-technology centers of excellence

across the state, was among the distinguished speakers at the ribbon cutting. Also speaking were Representative Thomas M. Reynolds, Senator Hillary Rodham Clinton, Senator Charles E. Schumer, New York State

Assembly Majority Leader Paul A. Tokasz, State Senator Dale M. Volker and Buffalo Mayor Byron Brown, as well as UB President John B. Simpson, PhD, and David C. Hohn, MD, president and chief executive officer of Roswell Park Cancer Institute (RPCI).

The four-story, 130,000-square-foot building housing the New York State Center of Excellence in Bioinformatics and Life Sciences was constructed by New York State at a cost of \$52 million. State funding for the center and its programs as of June has totaled \$89.4 million. In addition to \$27.75 million in direct federal funding, the Center of Excellence has received \$3.5 million in funding from the John R. Oishei Foundation and \$1.5 million from the Margaret L. Wendt Foundation. Funding from the private sector has totaled approximately \$60 million.

The New York State Center of Excellence in Bioinformatics and Life Sciences, a major research center of UB, works in close collaboration with academic partners RPCI

and Hauptman-Woodward Medical Research Institute (HWI).

Along with the new HWI building, which opened in May 2005, the Center of Excellence and RPCI's Center for Genetics and Pharmacology constitute the Buffalo Life Sciences Complex on the Buffalo Niagara Medical Campus. New York State funding for construction of the RPCI and Hauptman-Woodward buildings has totaled \$70 million.

The fact that the three buildings will be connected—an overhead bridge to be constructed will link the Center of Excellence with the HWI facility—underscores the close collaboration that will occur between the scientists who work in them in the development and commercialization of new drugs, therapies and

centers, capable of performing 22 trillion operations per second. CCR is being relocated to the Center of Excellence from the North Campus.

By working to harness its existing research and computational strengths—in tandem with the recruitment of accomplished scientists and an aggressive plan for commercialization of research discoveries—UB and the Buffalo-Niagara region are well positioned to move forward, according to Bruce Holm, PhD, UB vice provost and executive director of the Center of Excellence.

The Buffalo-Niagara region has a 100-year history of medical research that has produced advanced treatments for multiple sclerosis, cancer and stroke, as well as widely used

“HIGH-THROUGHPUT COLLABORATION IS ONE WAY WE STAND OUT. WE'RE ABLE TO ACCELERATE THE STANDARD ACADEMIC PROCEDURE FOR RESEARCH AND DEVELOPMENT, WHICH MAKES US VERY ATTRACTIVE TO INDUSTRY. IN A SENSE, THE BUILDINGS ARE A VESSEL FOR RETHINKING HOW RESEARCH INSTITUTIONS PRODUCE SCIENCE.”
—BRUCE HOLM, PHD

biomedical devices. Working together, the three institutions will draw upon their proven research strengths in genomics, structural biology and bioinformatics, as well as established core programs in cancer biology, neurology, virology and pharmacology. This research will be aided by the immense computational power of UB's Center for Computational Research (CCR), one of the nation's largest academic supercomputing

health therapies, such as the PSA test for prostate cancer and a surfactant-replacement drug for infants suffering from respiratory distress syndrome, Holm notes. The majority of DNA sequenced through the human genome project came from volunteers in Western New York, thanks to the proficiency of genetics researchers at RPCI.

The collaborative approach of three research institutions is aided by the open-lab design of the new build-

PHOTOS BY DOUG LEVENE

“THE PLAN IS TO RECRUIT ‘ENTREPRENEURIAL SCIENTISTS’ WHO ARE ATTRACTED TO STATE-OF-THE-ART RESEARCH FACILITIES, UNIQUE OPPORTUNITIES FOR COLLABORATIVE RESEARCH AND THE MOMENTUM OF THE REGION’S GROWING BIOTECH INDUSTRY.”

ings, which breaks down physical and operational barriers, Holm explains.

“High-throughput collaboration is one way we stand out,” he says. “We’re able to accelerate the standard academic procedure for research and development, which makes us very attractive to industry. In a sense, the buildings are a vessel for rethinking how research institutions produce science.”

As an example of this new

approach to research and development, a network of commercialization companies and organizations will reside on the second floor of the Center of Excellence. Such an arrangement is very unusual among academic biotech enterprises, Holm points out, and is intended to speed up research commercialization and facilitate the spin-off of biotech products and companies in Buffalo

Niagara. The 200 researchers and support staff occupying the Center of Excellence will have ample opportunity to interact with the commercialization arm of the center, in formal meetings or over morning coffee in the center’s café.

Over the next several months, UB, RPCI and HWI will continue to be engaged in a large recruitment effort to bring in additional top scientists to the Buffalo-Niagara region. The plan is to recruit “entrepreneurial scientists” who are attracted to state-of-the-art research facilities, unique opportunities for collaborative research and the momentum of the region’s growing biotech industry.

“The beautiful new buildings and the combined talents of the three institutions is an amazing draw,” Holm says. “When you combine that with the high quality of life in this region

and the growing national awareness of what we are accomplishing here, you have a formula for success that has tremendous potential.” **BP**



Below, left, state-of-the-art laboratories in the Center of Excellence in Bioinformatics and Life Sciences; below, right, Roswell Park Cancer Institute’s Center for Genetics and Pharmacology



Symposium Features Nobel Laureate

The grand opening of the New York State Center of Excellence in Bioinformatics and Life Sciences in June (see article on page 20) was marked by a full schedule of scientific and community events, including a science and industry symposium featuring world-renowned researchers in the fields of genomics, neuroscience and biomedical informatics.

Paul Greengard, winner of the 2000 Nobel Prize in Medicine and professor of molecular and cellular neuroscience at Rockefeller University, was among the distinguished speakers at the “Frontiers in Biological Systems” symposium, held June 13–15 at the Center of Excellence and the Hyatt Regency in Buffalo.

Other featured presenters included distinguished scientists Charles Cantor, chief scientific officer at SEQUENOM, a leading high-performance DNA analysis company based in San Diego, and Andrea Califano, professor of biomedical informatics at Columbia University, where he directs the Columbia MAGNet Center, one of seven National Centers for Biomedical Computing funded by the National Institutes of Health.

Cantor is author of the first textbook on genomics, *The Science and Technology of the Human Genome Project*. Califano is a pioneer in the field of computational biology.

“It is a tremendous endorsement for the Center of Excellence that so many extraordinary scientists agreed to speak at our symposium,” says Norma Nowak, PhD, director of scientific planning for the center. “We hope this was just the beginning of their relationship with the center, and that they will serve as ambassadors for the center as we begin recruiting talented scientists worldwide to join us in this exciting new venture at UB and in Buffalo.”

The symposium included two sessions describing the development and commercialization of biotech research from UB and in Buffalo.

“Innovation in Bioengineering Technologies” featured the work of the three

UB researchers who are developing tissue-engineered blood vessels, computer programs for analyzing X-ray images of blood vessels to improve treatment of heart and brain vessels, and a chemical sensor trained to recognize disease biomarkers, respectively.

“Success Stories in Building a Life Sciences Company in Western New York” featured commentary from the CEOs and presidents of three Buffalo-based biotech companies: SmartPill Diagnostics, Empire Genomics and Reichert Inc.

Also speaking at the symposium were scientists Michael Snyder, director of the Yale Center for Genomics and Proteomics; Thomas Blumenthal, professor and chair of biochemistry and molecular genetics at the University of Colorado Health Sciences Center; Claire Fraser-Liggett, president and director, the Institute for Genomics Research; David Relman, director of the Proteomics/Genomics Core at the Digestive Disease Center, Stanford University School of Medicine; Samuel Danishefsky, professor and director of bioorganic chemistry at Columbia University and Memorial Sloan-Kettering Cancer Center; Nathaniel Heintz, director, Laboratory of Molecular Biology, Howard Hughes Medical Institute; and Margaret Pericak-Vance, director of the Center for Human Genetics, Duke University Medical Center.

Also participating were Lawrence S.B. Goldstein, professor of cellular and molecular medicine at UC San Diego and investigator, Howard Hughes Medical Institute; Sangram Sisodia, director of the Center for Molecular Neurobiology, University of Chicago; Michael Becich, director of the Benedum Oncology Informatics Center, University of Pittsburgh Medical School; James Cimino, professor of biomedical informatics, Columbia University College of Physicians and Surgeons; and Charles Mead, senior associate, Booz Allen Hamilton.

—JOHN DELLA CONTRADA

Beautiful Botanical Note Cards are Back!

Our 3rd set of 19th Century Botanical Note Cards, features images reproduced from *offizinellen Gewächse*, a four volume set of pharmaceutical plants and their medicinal uses published in Germany in 1863. Each set contains 12 blank notecards and envelopes, three of each of the four designs.

Retail price is \$12 per set. Visit our History of Medicine Collection at <http://ublib.buffalo.edu/hsl/history/> or call 829-3900 x129 or x136 for more information.

The Notecards are part of the Health Sciences Library “Art in the Library” project, produced by the Health Sciences Art & Media Group (HSAMG). Please contact Pamela Rose at 829-3900 x129 or pmrose@buffalo.edu for more information.

2006 University at Buffalo Symposium on Women’s Health

Sponsored by the Department of Gynecology-Obstetrics in conjunction with sponsorships by the UB Departments of Family Medicine, Surgery, The School of Nursing, and the Kaleida Health System.

SATURDAY, SEPTEMBER 30, 2006
New York State Center for Excellence
in Bioinformatics & Life Sciences
Buffalo, New York

John Yeh, M.D. and Ronald E. Batt, M.D. Conference Directors

Breast Cancer: Mammography and Lifetime Follow-up
Dr. Janet H. Sung, Windsong Radiology

Breast Cancer: Surgery and Lifetime Follow-up
Dr. Stephen Edge, Roswell Park Cancer Institute

Pain Pathways: Central Nervous System and PNS
Dr. Mirjana Lovrinccvic, Roswell Park Cancer Institute

Chronic Pelvic Pain: Differential Diagnosis and Management
Dr. Fred M. Howard, University of Rochester

Endoscopic Surgery in the 21st Century
Keynote: Dr. Camran Neshat, Stanford University

Strategies to Minimize Professional Liability
Mr. Brian J. Weidner, Brozen & Tarantino, LLP

Will HPV Replace the Pap Smear?
Dr. Ralph Morgan Richart, Columbia University

Cerebral Vascular Disease in Women in the 21st Century
Dr. Lee R. Guterman, Buffalo Neurosurgery Group

For more information, call Patricia Szymkowiak at (716) 878-7508 or email szymkow@buffalo.edu.

Save the Date!