Mulchand Patel, PhD, UB Distinguished Professor, associate dean for research and biomedical education and professor of biochemistry, is one of three UB faculty members to receive the 2007 Research Foundation and Research Scholarship Award from the State University of New York (SUNY) Research Foundation. The award, which was presented by Research Foundation President John O’Conner at a dinner in Albany on May 2, recognizes Patel’s sustained research funding, his reputation in his field, his work with students and his community activities.

Throughout his career, Patel has focused his research on the regulation of metabolism and the role of nutrition in metabolic status. Currently, he is conducting work in the area of metabolic programming and the development of obesity. In 2004, Patel received the Stockton Kimball Award from the School of Medicine and Biomedical Sciences in honor of his academic accomplishments and worldwide recognition as a researcher.

The two other UB recipients for the Research Foundation and Research Scholarship Award were Rajan Batta, PhD, professor and associate dean of graduate education industrial and systems engineering, and Anthony S. Conrad, professor and director of graduate study, Department of Media Study.

Patel has focused his research on the regulation of metabolism and the role of nutrition in metabolic status.

Kalhan, whose laboratory is located in the Cleveland Clinic’s Lerner Research Institute, is an expert in whole-body metabolism who has pioneered a stable isotope technique in diabetes research. His primary interests include whole-body glucose, protein and amino-acid metabolism in various physiological states such as pregnancy, newborns and adolescents, and in disease states such as diabetes and liver disease. Kalhan will fulfill his Visiting Professorship early in 2008. Mulchand Patel, PhD, UB Distinguished Professor of biochemistry, will be Kalhan’s host during his visit and will prepare the schedule of events that will include pediatric grand rounds, lecture, and research seminar and workshop.

Kalhan is an expert in whole-body metabolism who has pioneered a stable isotope technique in diabetes research.

Michael Kuettel, MD, MBA, PhD, professor and chair of the Department of Radiation Oncology at UB and chair of the Department of Radiation Medicine at Roswell Park Cancer Institute (RPCI), has been named president-elect of the American College of Radiation Oncology (ACRO).

ACRO’s mission is to ensure the highest quality care for radiation therapy patients and to promote success in the practice of radiation oncology through education, responsible sociocultural advocacy and integration of science and technology into clinical practice. It is managed by a 15-member Board of Directors who are elected by the ACRO’s membership.

The Louis A. and Ruth Siegel Awards for Excellence in Teaching are the foremost means for recognizing extraordinary teachers in the School of Medicine and Biomedical Sciences. A student award committee comprised of representatives from each medical class reviews nominations provided by students and selects awardees in four categories. Considerations for this prestigious annual award include instructional skill, ability to stimulate thinking and develop understanding, demonstration of sensitivity toward the human condition, and serving as a role model for students.

The 2007 Siegel Award recipients are:

- Michael Kuettel, MD
- Carl G. Granger, MD
- Sarah J. Kuettel, MD
- Zanele N. Wall, MD

**Visiting Professorship in Diabetes**

The School of Medicine and Biomedical Sciences has been awarded a nationally competitive grant from Pfizer Inc. to fund a Visiting Professorship in Diabetes for 2007–2008. The unrestricted funds made available through the program facilitate in-depth, educationally focused visits by prominent medical experts to U. S. medical schools or hospitals.

The clinical researcher invited by UB to participate in this exchange is Satish Kalhan, MD, professor in the Department of Pediatrics and Reproductive Biology at Case Western Reserve University School of Medicine, and director of the Schwartz Center for Metabolism and Nutrition at MetroHealth Medical Center in Cleveland, Ohio. Kalhan, whose laboratory is located in the Cleveland Clinic’s Lerner Research Institute, is an expert in whole-body metabolism who has pioneered a stable isotope technique in diabetes research.

**Granger Honored by Physiatrists Association**

Carl G. Granger, MD, professor of rehabilitative medicine and executive director of the Uniform Data System for Medical Rehabilitation at UB, received the Distinguished Member Award from the Association of Academic Physiatrists (AAP) at its annual meeting in April. The Distinguished Member Award, the highest award that is given by the AAP, is conferred upon an individual whose work has garnered him or her international status; who is recognized as a major contributor to the field by virtue of teaching, research and scholarly publications; and who is noted for dedicated service to the AAP.

**Kuettel to Lead American College of Radiation Oncology**

Michael Kuettel, MD, MBA, PhD, professor and chair of the Department of Radiation Oncology at UB and chair of the Department of Radiation Medicine at Roswell Park Cancer Institute (RPCI), has been named president-elect of the American College of Radiation Oncology (ACRO).

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**Kuettel**
Gresham Receives 2007 Coke Award

Glen Gresham, MD, former chair of the Department of Rehabilitation Medicine, received the University at Buffalo Alumni Association’s 2007 Walter P. Coke Award, which is bestowed on non-alumni who have made notable and meritorious contributions to UB. He was one of 12 individuals honored with achievement awards at a black-tie gala held in the Adam’s Mark Hotel in downtown Buffalo on April 28. UB President John B. Simpson and UB Alumni Association President Charles Swankem, MBA ’80, JD ’79, presented the awards at the event, which was emceed by Susan Banks, former news anchor for WKBW-TV.

The awards are presented each spring to alumni and friends of UB for bringing distinction to themselves and the university through outstanding professional and personal achievement, loyal service to the university and exemplary service to their communities.

Gresham received his undergraduate degree from Harvard University and his medical degree from the Columbia University College of Physicians and Surgeons. In 1978, he was recruited to UB as chair and professor of the School of Medicine and Biomedical Sciences’ Department of Rehabilitation Medicine. Over the course of his 20-year career, he helped make Erie County Medical Center (ECMC) a teaching-hospital affiliate of the university and a leader in care related to cardiovascular disease, spinal cord injury and head trauma.

Elizabeth G. Nabel, MD, who spoke at the commencement ceremony for medicine on May 4, is the director of the National Heart, Lung, and Blood Institute, where she oversees an annual budget of almost $5 billion and a staff of approximately 850 employees. A board certified cardiologist, she is a recognized expert in the development of novel genetic and cellular therapies for cardiovascular disease. Her research on vascular biology and the regulation of smooth-muscle cell growth has provided important insights into the development of heart disease. In addition, she is a champion of the concept “from bench to bedside.”

Nabel is a member of the Institute of Medicine of the National Academy of Sciences, the American Society of Clinical Investigation, and the Association of American Physicians. She has received numerous awards, including the Distinguished Achievement Award from the Basic Cardiovascular Sciences Council of the American Heart Association and the Angen-Scientific Achievement Award from the American Society for Biochemistry and Molecular Biology. In 2001, she received an honorary doctoral degree from the University of Leuven in Belgium.

Susan Band Horwitz, PhD, who spoke at the commencement ceremony for the biomedical sciences on May 10, is Distinguished Professor and co-chair of the Department of Molecular Pharmacology and the Falkenstein Professor of Biomedical Sciences at the Albert Einstein College of Medicine of Yeshiva University. She is world renowned for her pioneering work in elucidating the mechanisms of action of antitumor agents. Her pivotal research in the 1980s led to the development of Taxol®, one of the most important anti-cancer agents ever developed. In recent years, she has focused on the mechanisms of drug resistance, an increasingly serious problem in cancer treatment. Horwitz is a member of the Institute of Medicine of the National Academy of Sciences and a past-president of the American Association for Cancer Research. She has received numerous honors and awards, including the Calo Memorial Award of the American Association for Cancer Research in 1992, the ASPET Award for Experimental Therapeutics in 1994, the C. Chester Stock Award from Memorial Sloan-Kettering Cancer Center in 1996, and the Warren Alpert Foundation Prize from Harvard Medical School in 2003.

On May 11, Horwitz also presented a Distinguished Scientist Seminar to UB faculty and students. For more on the School of Medicine and Biomedical Sciences’ commencement ceremonies, turn to page 16.
Born Free of HIV
Establishing a regional HIV-in-Women Research Network

Although high salaries attract most pharmacists to private practice after graduation, a UB specialist in infectious diseases and HIV says she aims to show future pharmacists that academia offers rewards no amount of money can buy.

By Kevin Feiling

Patty Fan-Havard hopes to establish a regional HIV-in-Women Research Network between Erie County Medical Center (ECMC), Ohio State University and the University of Rochester Medical Center.

If just one more infant born free of HIV is priceless, then Patty Fan-Havard—who has helped close to 100 babies be born HIV-negative in the past six years alone—will no doubt teach her students that work such as this is invaluable.

Fan-Havard, an associate professor of pharmacy practice and division head of Pharmaceutical Therapy Research Programs in the School of Pharmacy and Pharmaceutical Sciences, joined the UB faculty last fall.

"During my tenure at Ohio State University (OSU)," she says, "I worked very closely with the Division of Infectious Diseases in the College of Medicine, the Department of Obstetrics and Gynecology, and Columbus Children’s Hospital to establish and implement an HIV High-Risk Pregnancy Program. It was a multidisciplinary clinic that provided seamless care for pregnant HIV-infected women and their newborns.

"During the five years I worked at the clinic, she adds, "we delivered well over 85 patients and none was [HIV] positive."

Other statistics from the clinic are more sobering, however. Eighty-eight percent of patients were single mothers and more than 90 percent were unemployed and on Medicaid or some other form of government assistance. Up to 60 percent did not know about their HIV status until their pregnancy, she says.

Fan-Havard also pointed out that 75 percent of patients were African-American, of which 22 percent were continental Africans from such countries as Somalia and Ethiopia. "There’s such a disparity, in that HIV/AIDS affects more African-American women," she says. "The profile is very similar for the patient population at ECMC."

One of her professional goals at UB is to establish a regional HIV-in-Women Research Network between ECMC, OSU—where she remains on the faculty as a clinical associate professor in the Department of Obstetrics and Gynecology—and the University at Rochester Medical Center, a member of the NIH-funded AIDS Clinical Trials Group.

"What is impressive about the HIV program at ECMC is that pharmacists also participate in interpreting the HIV-susceptibility testing and formulating treatment options to the physician for their final treatment recommendation," she says.

[HIV pharmacotherapy] really is a specialty that requires a close working relationship with infectious-disease specialists, nurses, microbiologists and other health-care providers," she adds, also taking on greater roles with HIV patients since the most effective treatment for HIV—the well-known "AIDS cocktail" or HAART (Highly Active Anti-retroviral Therapy)—can involve a daily drug regimen of up to a dozen pills, she says.

"Pharmacists not only educate patients about their medications and disease, we also think of ways to improve adherence," she says, noting that adherence is one of the biggest barriers to treatment because patients require more than 95 percent of their regular doses. "We assess for potential drug-drug interactions and drug-food interactions as well," she adds.

As the recipient of a doctorate degree in pharmacy from the University of the Pacific School of Pharmacy in 1985, Fan-Havard says she first started encountering HIV patients in the late-1980s as an assistant professor of pharmacy practice at Rutgers University and clinical specialist at the Veteran’s Affairs Medical Center in East Orange, New Jersey.

"Patients were coming down with opportunistic infections and [the cancer] Kaposis Sarcoma in the early ’80s," she recalls. "It used to be thought of as a gay men’s disease, but then it was realized it was caused by an infectious organism and HIV was identified as the virus attacking the immune system." Improved drugs started to be introduced around the time she moved to Ohio in the 1990s, she adds, but notes it took time for health professionals to learn how to prescribe these medications to manage the disease.

At UB, Fan-Havard will pursue research into the effect of HIV protease inhibitors on placental vascular architecture using tissue samples from her clinic at OSU, contributing knowledge to dosing guidelines for HIV-pregnant women. She is also the principal investigator on a $100,000 grant from the National Institute of AIDS Research and Southwest National Primate Research Center that is examining the effects of a well-known HIV drug on the liver toxicity in pregnant baboons. "Nevirapine is one of the more effective agents in reducing [mother-child] HIV transmission in developing countries," she explains. "However, nevirapine resistance can develop with a single dose and so international efforts are under way to optimize therapy during pregnancy."

Additional goals at UB include developing a database on HIV-pregnant women for ECMC and pursuing overseas collaborations to encourage international education on HIV.

Fan-Havard teaches two classes this semester—a clinical research course and a pharmaceutical therapeutics course—to students pursuing doctorates in pharmacy.

"I’ve been absolutely impressed with our students who are interested in going into infectious-disease research," she says. "We’re really making efforts to recruit the top applicants into our program. We are getting students not only locally, but nationally, who want to be a part of this program."

Fan-Havard also pointed out that 75 percent of patients were African-American, of which 22 percent were continental Africans from such countries as Somalia and Ethiopia. "There’s such a disparity, in that HIV/AIDS affects more African-American women," she says. "The profile is very similar for the patient population at ECMC."
Pathways

Marketers to Market
By Lauren N. Maynard

In the late 1990s—well before “personalized medicine” became a buzzword—Norma J. Nowak’s genomics research group at Roswell Park Cancer Institute (RPCI) established a reputation as one of the industry’s go-to labs, due in large part to the instrumental role it played in the Human Genome Project. In recent years, the lab’s reputation for gene-expression research has only been enhanced as the industry’s go-to labs, due in large part to the instrumental role it played in the Human Genome genomics research group at Roswell Park Cancer Institute (RPCI) established a reputation as one of them from academic settings to conservative technologies, bringing and help commercialize innovation with the University at Buffalo support businesses affiliated with the Center of Excel- Technology (UB CAT), which is housed at the Center of Excel- Technology (UB CAT), which is housed at the Center of Excel- Technology (UB CAT), which is housed at the Center of Excel- Technology (UB CAT), which is housed at the Center of Excel- Technology (UB CAT), which is housed at the Center of Excel-

Today, in addition to continuing to serve as director of Roswell Park’s DNA Microarray and Genomics Facility, Nowak also serves as director of science and technology at UB’s New York State Center of Excellence in Bioinformatics and Life Sciences. Supported by RPCI’s mission to search out cancer targets and by UB’s academic structure, Nowak has recently taken on a new project: the launch of a genetic-molecular diagnostics company, called Empire Genomics LLC (EG), which made its debut in the multibillion-dollar global genetic diagnostics market this April.

To get a head start, EG has worked closely with the UB Center for Advanced Bio-medical and Bioengineering Technology (UB CAT), which is housed at the Center of Excellence (see sidebar, opposite). UB CAT’s grants and resources support businesses affiliated with the University at Buffalo and help commercialize innovative technologies, bringing them from academic settings to commercial offerings.

At the heart of EG’s business is a technology called Array Comparative Genomic Hybrid- ization, or aCGH, a powerful synthesis of semiconductor technologies and systems biology. EG plans to sell genetic-disease tests and research tools in “kits” that will include DNA microarrays spotted with cloned DNA reference samples, called artificial bacterial chromosomes (BACs), banded with reagents and software that will provide easy-to-read test results for customers.

Diagnostic arrays, such as aCGH, Nowak says, are “extensions of classic cytogenetics” and have become a powerful new way to develop biomarkers for hereditary disorders and to detect early disease. “The major shift in aCGH technology is in its use as a diagnostic tool, not just for research.”

Whereas traditional cytogenetics looks at an entire chromosome’s banding patterns for the presence or absence of genes, aCGH takes a more detailed snapshot and can more accurately measure the amount of genetic material that may or may not indicate a disease or disorder. Tests can now be designed to detect Trisomy 21, 18, microdeletion syndromes, pre- and postnatal abnormalities, cancer, mental retardation, autism and schizophrenia.

In the area of cancer diagnostics, for example, tumor tissues are difficult to grow in culture, making traditional chromosome analysis difficult. The aCGH test, therefore, can help oncologists identify genetic changes in tissue samples that could influence the type of therapy they prescribe for a patient.

Empire Genomics, says Nowak, can position itself as a leader in high-throughput aCGH testing and services because it is the only company with a proven track record of expertise, accuracy and reliability that is amplified by its technology platform.

In particular, EG’s aCGH technology platform provides 100 times the resolution currently used in the molecular cytogenetics field and more than twice the number of validated BACs than anyone in the market, allowing it to service large, rapid-growth markets and differentiate itself from the competition.

The EG aCGH testing method also reduces “noise,” or variance, on the slide readouts, improving the signal—and diagnostic accuracy—for determining chromosomal aberrations and is much faster than chromo- some karyotyping. It takes 24 hours for Nowak to analyze hybridized DNA compared to several weeks for traditional methods. These advantages stem from proprietary methods that EG has developed, she says.

As her bench science evolved, Nowak realized that commercializing EG’s product would be the largest hurdle. In 2005, Marnie LaVigne, PhD, director of business development at the Center of Excellence, brought in Anthony Johnson, PhD, of Invitrogen Corporation, to help Nowak realize her dream of commercializing her technology.

Johnson’s business management firm, Buffalo BioSciences LLC, was the first partnership choice because it was housed in the Center of Excellence with the sole mission to jump-start companies like EG. That, as well as Johnson’s extensive experience in the biotech field, helped Nowak concentrate on the science. With his partners at Buffalo BioSciences, Johnson leads EG’s commercialization efforts in such areas as marketing and sales, funding, licensing, strategy and business development.

EG’s initial customer focus is on the global genetic research market. At the same time, the company is preparing to enter the burgeoning molecular diagnostic marketplace.

Revenue generated from the research marketplace will help EG develop diagnostic arrays, starting with a pre- and postnatal diagnostics chip. “Our platform could help test fetal or newborn blood to see beyond the microscope’s resolution,” Nowak says.

EG will also have access to extensive tissue libraries, to identify novel cancer biomarkers and accelerate product development for early cancer diagnosis and prognosis testing.

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Another area of market focus, says Johnson, is phar- macogenomics, or “personal- ized medicine,” where drugs are developed that prevent or treat disease based on an individual’s genetic makeup.

EG hopes to help pharmaceu- tic companies stratify clinical trial populations to determine which subjects will have the ideal drug responses. “There are a lot of high-volume customers who are willing to pay a premium for this service,” Nowak says. “Novartis’ Gleevec is the first marketed drug to use this tech- nology in clinical trials.”

EG began selling its prod- ucts and services in April, in partnership with Buffalo BioSciences.

Johnson conservatively estimates that EG will earn more than $50 million in revenue and create 30 to 40 high-paying jobs in the next five years. The company requires only a small percent of market penetration to achieve those objectives, he adds, because the demand is now in place for high-quality genetic testing.

“This technology is at a very early stage and is just beginning to gain traction in the commercial markets,” Johnson says. “We’re looking at several new customers coming online almost daily.”

Through investors and other funding sources, the company plans to raise at least another $1 million in capital investment to increase staff in areas of marketing, customer service, operations and regulatory affairs. Ed Chait, former CEO of the first aCGH commercial diagnostic provider, Spectral Genom- ics, is serving as an adviser as EG continues to build its management team and board of directors.

What is a CAT?
By Marnie LaVigne, PhD

The State University of New York at Buffalo Center for Advanced Biomedical and Biotechnology (UB CAT) operates within the New York State Center of Excellence in Bioinformatics and Life Sciences. The purpose of UB CAT is to support university-industry collaboration in research, education, and technology transfer, with a strong focus on helping New York State-based businesses gain a technological edge on their competition.

Operating under the auspices of the New York State Office of Science, Technology and Academic Research (NYSTAR), UB CAT is fueling continued growth of promising technologies in some of the most important sectors of the state’s economy.

UB CAT fosters the creation of new biotech start-up companies and helps existing biomedical businesses expand through new or improved products.

Researchers or entrepreneurs seeking assistance to develop a new technology—whether it be in biotechnology, biomedical informatics, diagnostics, medical devices, or pharmaceuticals—can contact Marnie LaVigne, PhD, at lavigne2@buffalo.edu for more information.