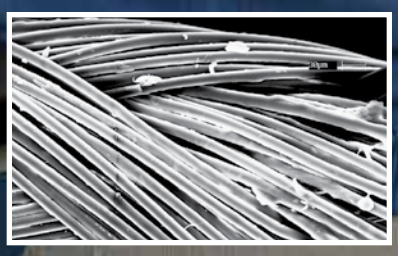
# Human ECOLOGY

College of Human Ecology, Cornell University • Volume 39, Number 1 • Spring 2011

## Weill Medical **Research Connections**



**Partnerships Lead to Medical Patents**
*page 4*

# What's

*Weill Cornell Medical College in New York City*

*ON THE COVER: C. C. Chu (left) and William Reisacher are testing microspheres to treat allergies.*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Cornell's College of Human Ecology publishes this magazine to illustrate how its programs address complex societal issues to improve the human condition. This mission of human improvement is accomplished through faculty initiatives in research, outreach, and teaching—with an emphasis on an ecological perspective, collaborative projects, and multidisciplinary curricula within and across five academic units: the Department of Design and Environmental Analysis; the Department of Fiber Science & Apparel Design; the Department of Human Development; the Department of Policy Analysis and Management; and the Division of Nutritional Sciences, a unit shared with the College of Agriculture and Life Sciences. The college includes the Family Life Development Center, the Bronfenbrenner Life Course Center, and the Sloan Program in Health Administration.

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**In**Short **2**

## High-Risk in Haiti

A novel nutrition program nourishes HIV-positive mothers and their babies by bridging the gaps between clinic and community.


8


**Cover Story**

## Partnerships Lead to Medical Patents

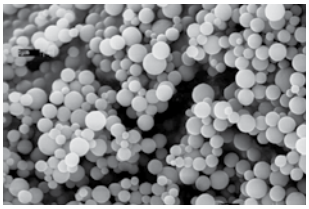
An intercampus research team steers scientific progress on biomaterials for human body repair and healing.


4


## Tipping the Scales

Researchers ally with local churches and clinics to reduce obesity in some of New York City's poorest neighborhoods.


12

Dean's Corner

## Strong Partnerships Broaden Research Avenues

As our college takes aim at some of the most complex of society's problems, it is striking how many of our most successful efforts include cross-college partnerships beyond the walls of Martha Van Rensselaer Hall. In particular, our partnership with Weill Cornell Medical College has grown from shared resources and insights into critical collaborations that now represent leadership in several fields of study.

The faculty research featured within this issue of *Human Ecology* demonstrates the tremendous impact that can result from the blend of Human Ecology's social science research expertise with the clinical research environment offered by Weill. These shared efforts are driving the development of biomaterials for human body repair, public health education efforts to address obesity in New York City neighborhoods, and an innovative nutrition program to improve maternal and child health at Cornell's GHESKIO clinic in Haiti.

As a teacher and researcher, watching these groundbreaking discoveries unfold is very exciting. I hope as you read this issue that you'll share my excitement for these findings, which hold great promise for improving the human condition.

-Alan D. Mathios, Rebecca Q. and James C. Morgan Dean

# inside. . .



# In Short

## Expert in preventing youth drug abuse discusses linking research with practice

*Gilbert Botvin (right) and John Eckenrode, director of the Family Life Development Center*

Gilbert Botvin, professor of psychology at Weill Cornell Medical College and a leading researcher in the prevention of adolescent tobacco, alcohol, and drug abuse, presented the fourth annual John Doris Memorial Lecture on April 6. Botvin, principal investigator on numerous National Institutes of Health–funded prevention projects that extend to some 300 schools and 40,000 students, discussed how to translate empirical findings into effective school-based interventions. He focused on his LifeSkills Training program, an evidence-based approach that builds children's social and self-management skills, along with educating them about the dangers of substance abuse. The Doris Lecture is named for the late John Doris, professor emeritus of human development and founding director of the Family Life Development Center.

## Sloan climbs sharply in latest *U.S. News* rankings

Among health care management programs, the Sloan Program in Health Administration is ranked 14th in the nation in *U.S. News and World Report's* 2012 edition of "America's Best Graduate Schools," released March 15. Sloan's move into the top 15 is an 11-point rise from the 2008 edition. Compiled every four years, the *U.S. News* rankings of health programs are the result of peer assessments by program directors and faculty. "We are very pleased by the improvement in Sloan's ranking and want to thank alumni, students, faculty, and the College of Human Ecology leadership for their help and support in moving the program forward," said program director William White.

## Tennyson named editor of influential consumer affairs journal

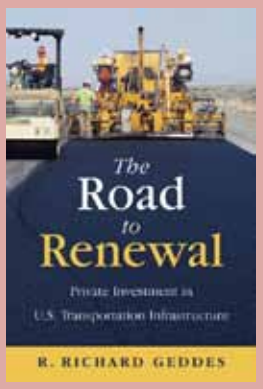
Cornell economist Sharon Tennyson, an expert on consumer protections and financial regulation, took over as editor of the *Journal of Consumer Affairs* June 1. The peer-reviewed journal, founded in 1967 by the American Council on Consumer Interests, features research and analysis on the social, legal, economic, and political influences on consumer interests. "We live in an era of heightened awareness and concern about consumer issues, making this an especially exciting time to take over as editor," said Tennyson, associate professor of policy analysis and management. Tennyson's teaching and research focuses on the impact of government laws and regulation on consumers and financial institutions, particularly the workings of insurance markets.

## Researchers study how to support the transition to adulthood in Latin America

Key features of community programs to help marginalized youth and young adults successfully transition to adulthood include mentoring and opportunities for work and leadership roles, according to a Cornell study in Latin America. The 18-month "action research" project, Opening Pathways: Youth in Latin America (Abriendo Caminos: Jóvenes en América Latina), engaged four organizations in Argentina, Mexico, and Colombia in a process to improve understanding of how community programs can make their community a better place for youth and young adults. The project, led by Stephen Hamilton, professor of human development; Mary Agnes Hamilton, director of the Cornell Youth in Society Program; and Davydd Greenwood, the Goldwin Smith Professor of Anthropology, was supported by the Jacobs Foundation in Switzerland.

## Economist's new book calls for private dollars to fix U.S. transportation

America's roads, bridges, and highways are failing: In its 2009 report card, the American Society of Civil Engineers gave U.S. transportation infrastructure a "D." In his new book, *The Road to Renewal: Private Investment in U.S. Transportation Infrastructure* (AEI Press, Jan. 2011), R. Richard Geddes, associate professor of policy analysis and management, offers a host of solutions to repair our decaying transportation system and address the political gridlock that delays upgrades. Geddes's key recommendation is for public-private partnerships that can inject fresh capital and hold government accountable to citizens. Otherwise, he wrote, government spending for roads will continue to fall short and lead to more crowded and hazardous commutes.



## Positive outlook on life eases chronic pain

A person's outlook on life can minimize—or aggravate—one's chronic pain, found a new study led by Anthony Ong, assistant professor of human development, and M. Cary Reid, M.D., associate professor of medicine at Weill Cornell Medical College. Ong and colleagues reported that a person's habitual outlook on life and their ability to sustain positive emotions in the face of adversity or stress (what psychologists call psychological resilience) can make a dramatic difference in their experience of chronic pain, which afflicts millions of Americans, particularly the growing population of elderly. "While pain is a fact of life for many," said Ong, "how people relate to their pain can either help or hinder healthy coping."

## Collision of climate change and aging populations needs serious study

Human Ecology researchers are calling on their colleagues around the world to focus on how aging global populations will intersect with climate change and pressure for environmental sustainability. In an article published in the *Journal of Aging and Health* (April 2011), professor of human development Karl Pillemer and four Cornell colleagues argued that environmental threats disproportionately affect the health of the aging. "These risks are likely to increase as the effects of climate change are felt," the authors wrote. "The older population is at greater risk for adverse health effects from extreme temperatures, susceptibility to disease, stresses on the food and water supply, and reduced ability to mobilize quickly." Co-authors of the new article include Nancy Wells, associate professor of design and environmental analysis; Rhoda Meador, associate director of extension and outreach for Human Ecology and associate director of the Bronfenbrenner Life Course Center; Jennifer Parise, graduate student in human development; and Linda Wagenet, former senior extension associate in development sociology, College of Agriculture and Life Sciences.

## Fiber and design group tours textile facilities on 14-day India trip

Thirteen students and four faculty members from the Department of Fiber Science and Apparel Design (FSAD) visited the Indian cities of Mumbai, Surat, Coimbatore, and Hyderabad Jan. 4–18, touring textile and apparel production facilities. Among the highlights on FSAD's first-ever sponsored trip overseas, said trip coordinator and associate professor Charlotte Jirousek, were visits to a hand-embroidery workshop; commercial weaving, dyeing, printing, and knitting operations; a cotton processing and spinning mill; and an ikat dyeing and hand-weaving cooperative. The FSAD students were part of Cornell's International Agriculture and Rural Development (based in the College of Agriculture and Life Sciences) yearly field trip to India and the pre-trip course, Agriculture in the Developing Nations.

## Four nutritional sciences faculty honored for research and service

The American Society for Nutrition recognized four faculty members in the Division of Nutritional Sciences in February for their superior achievement in nutrition research and public service. Patsy Brannon, professor, was awarded the Roland L. Weinsier Award for Excellence in Medical/Dental Nutrition Education in recognition of an outstanding career that includes innovations in medical/dental education. David Levitsky, professor, received the Excellence in Nutrition Education Award for outstanding contributions to teaching nutrition. Ling Qi, assistant professor, was awarded the Bio-Serv Award for meritorious research in nutrition using experimental animals as models. Barbara Strupp, professor, received the Centrum Center Award in recognition of recent investigative contributions of significance to the basic understanding of human nutrition.

An intercampus research team steers scientific progress on biomaterials for human body repair and healing.

# Partnerships Lead to **Medical Patents**

BY JENNIFER WOJCIKOWSKI

Sixty-three U.S. and international patents for pseudo-protein biomaterials have emerged from the Ithaca lab of C. C. Chu, the Rebecca Q. Morgan '60 Professor of Fiber Science and Apparel Design in the College of Human Ecology—just in the past decade. With more patents pending and extensive partnerships with doctors and researchers at Weill Cornell Medical College (WCMC) in New York City, Chu continues to expand the use of biomaterial properties and practicalities in the treatment of wounds, diseased heart valves and blood vessels, bone repair, gene transfection for gene therapy, immunotherapy for cancer patients, and allergy treatment.

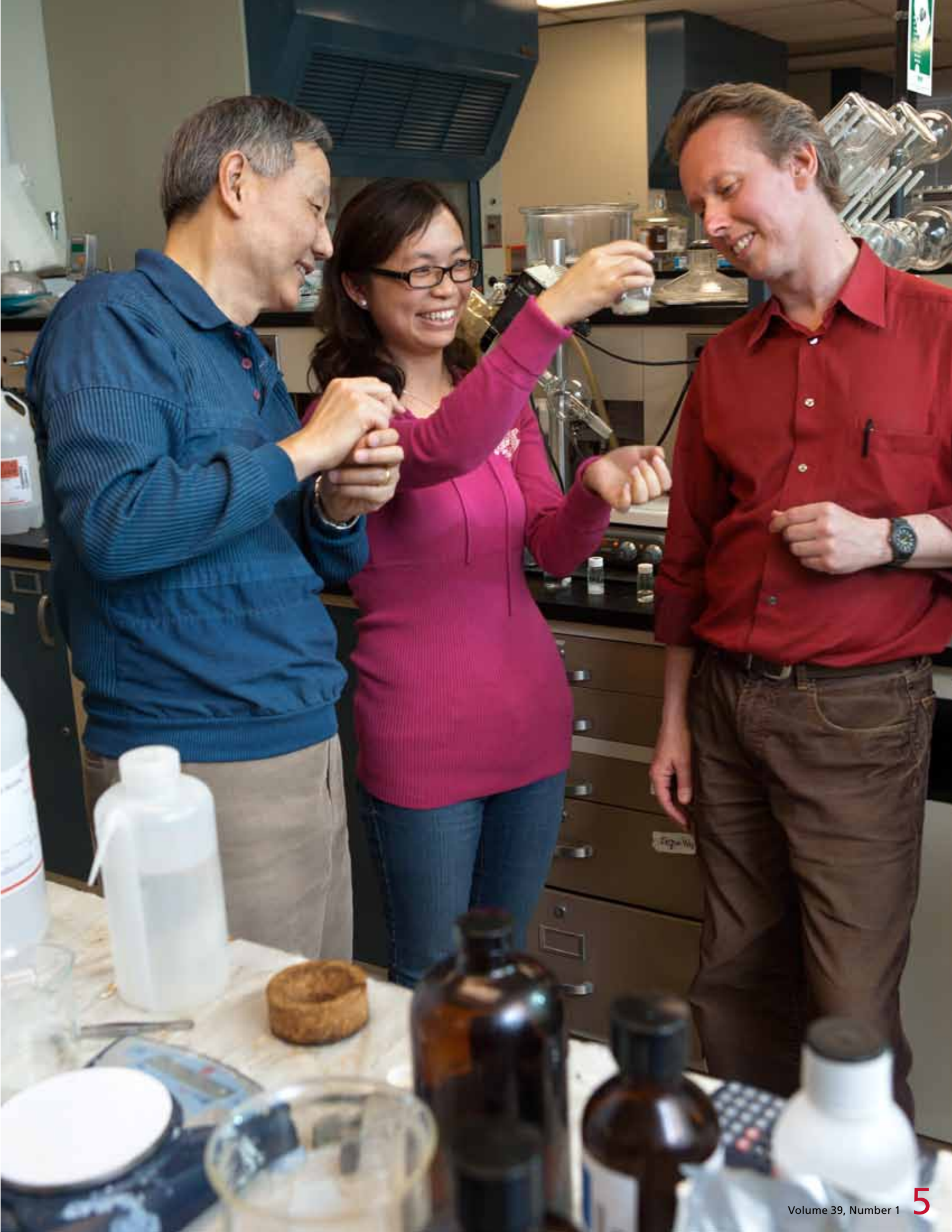
The collaborations are helping to bridge the gap between research and medical practice, enabling WCMC doctors to imagine new possibilities for treatment and Chu to test potential uses for his discoveries.

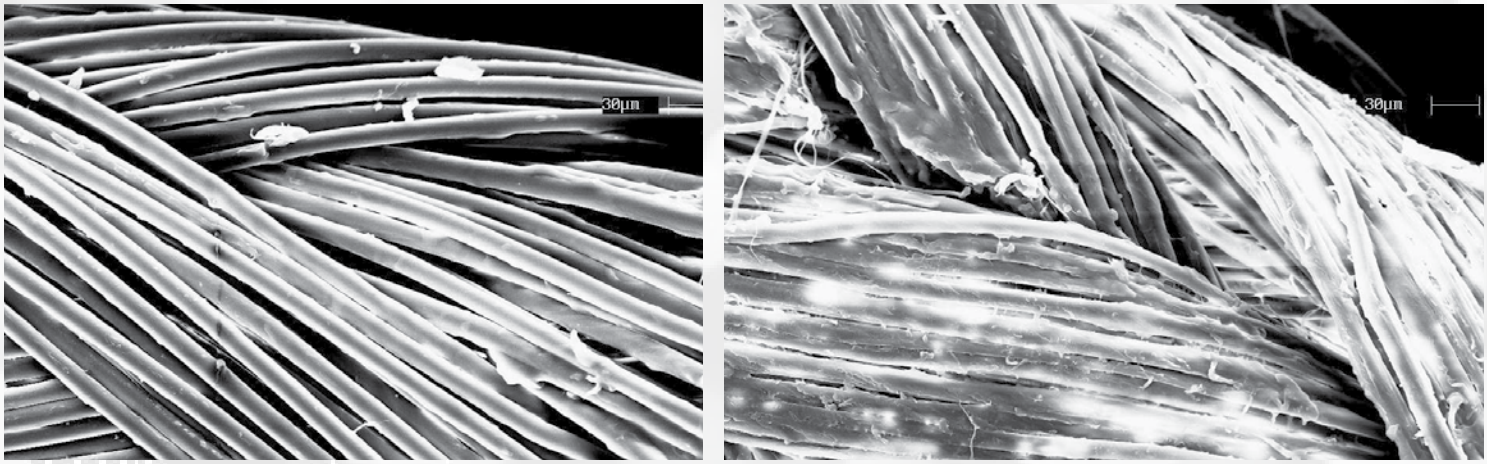
"Each generation of these products offers new applications and better performance than previous ones," said Chu, one of the founding members of the Biomedical Engineering Program at Cornell. "In my tribe [Chu's term for his lab] we are never standing still."

A key driver of Chu's continued progress is Cornell's commitment to fostering and funding working partnerships among researchers, especially within biomedical engineering, nanomedicine, and systems biology; diagnostics and experimental therapeutics; global health and infectious diseases; and cancer-related cell biology. These collaborations leverage Human Ecology and WCMC expertise and resources to advance research and development beyond what the traditional "silo" approach can yield.

"Although difficult to coordinate at times," said Bo Liu, a specialist in vascular disease, "these working relationships provide researchers access to clinical testing, making their discoveries much more translational." > > >

*C. C Chu (left) collaborating in the lab with Dr. William Reisacher and Xiao-Hong Qin, a visiting professor from DongHua University, College of Textiles, Shanghai, China.*






*High-level magnification shows a conventional surgical suture made of silk (right) and a PEA-coated suture (left) designed to reduce inflammation and promote healing.*

## Vascular grafts deliver drugs

Chu has partnered with Liu to create drug-eluting, biodegradable vascular grafts. Their research is supported by the Morgan Seed Grants for Collaborative Multidisciplinary Research in Tissue Engineering. Liu's lab provided a clinical outlet for Chu's biomaterial research, advancing it from traditional material study to small animal testing, a critical first step in the long journey from basic research to clinical practice. The data collected by Liu, now an associate professor at the University of Wisconsin, have helped Chu to significantly advance the performance of biomaterials for cardiovascular treatment.

Vascular grafts have been commercially available for more than 50 years. While effective, these grafts are made of traditional fabrics such as polyesters and Gore-Tex that are non-biodegradable and offer no drug-eluting capabilities. Chu's vascular grafts, on the other hand, consist of patented amino-acid–based polyester amides (PEA) biomaterials invented in Chu's lab that are capable of delivering a wide range of bioactive compounds, such as nitric oxide.

Chu said the advantage to human cardiovascular health is that his grafts "biomimic" what the natural blood vessel already does. "Using nitric oxide for the vascular grafts was a natural choice because it is indigenous to the body," said Chu. "When stimulated, the body produces nitric oxide to dilate the blood vessels along with a host of other critical biological functions, helping to keep them open for optimal blood flow."

When rat aortic patches were tested in Liu's lab, the nitric oxide–eluting vascular grafts showed significant advantages over non-eluting grafts, including the ability to promote endothelial cell lining, protect against intimal hyperplasia (the thickening of the vessel wall), and mute inflammation.

The Chu lab's PEA-based biomaterials offer another advantage, thanks to an unusual and unique biological property: muted inflammatory response to foreign bodies. It's a trait that is unmatched by current FDA-approved biomaterials and their medical devices, Chu said.

Their unique properties allow them to be tailored for many specific clinical applications: as scaffolds for tissue growth and regeneration; as stents for treating cardiovascular diseases; or as delivery vehicles for therapeutic biologics, drugs, or DNA. The biomaterials' versatility enables Chu to engineer them into fibers, gels, spherical particles (nano or micron size), and fibrous membranes. The diverse applications of these fabricated forms have led Chu into several new partnerships with WCMC scientists working to improve surgical sutures, allergy disease immunotherapy, and prostate cancer treatments.

"Every university should have these types of collaborations," said Dr. Jason Spector, assistant professor of plastic surgery and director of the Laboratory of Bioregenerative Medicine and Surgery at WCMC. "Every day I see things on the clinical side that need to be improved, but without access to bioengineers, I don't have the ability or the tools to solve them."

> **"Every day I see things on the clinical side that need to be improved, but without access to bioengineers, I don't have the ability or the tools to solve them."**
>
> —Dr. Jason Spector

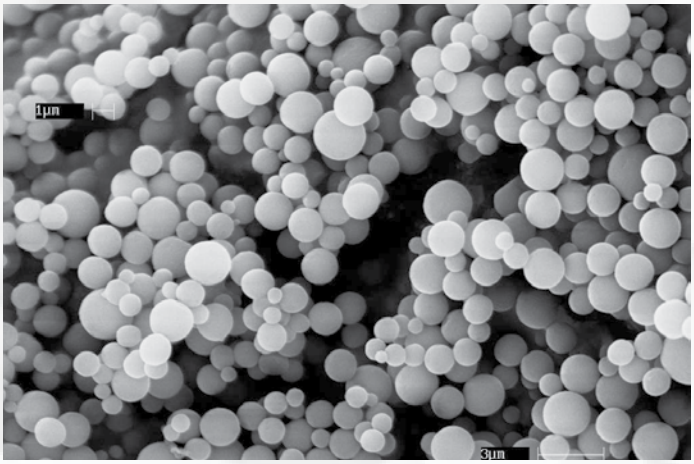
Chu said the partnerships are mutually beneficial, granting him access to the knowledge and resources to evaluate the biological properties and therapeutic values of his new inventions.

## Surgical sutures promote healing

Currently, Spector and Chu are working together to improve the performance of surgical sutures by reducing their foreign-body–induced inflammatory response, which, in turn, can significantly improve the healing process. Commercially available sutures made from natural proteins such as silk and catgut are absorbable by the body but often trigger inflammation due to their foreign protein structure that differs from what the body itself produces. Chu discovered that coating these sutures with PEA-based biomaterials could lead to a dramatic reduction in inflammatory response as shown in an animal coronary artery model.

"One of the many advantages of the PEA is that they are cell, tissue, and blood friendly," explained Chu. "They are of the body and for the body, which enhances overall acceptance during absorption."

Spector and Chu are in the midst of testing absorbable




*Paclitaxel-loaded PEA microspheres carrying allergenic proteins could lead to innovative treatments for allergies.*

sutures in mice in Spector's lab. Like Chu's work with Liu, Spector's and Chu's collaboration has enabled this new development to move from materials research into animal testing, thereby increasing the probability of it moving into clinical trials.

## Microspheres treat allergies

The PEA's muted inflammatory and drug-eluting properties have also led to a working partnership between Chu and Dr. William Reisacher, assistant professor of otorhinolaryngology and the director of the Allergy Center at New York Presbyterian Hospital/ WCMC. Reisacher developed an innovative method of treating allergies using injections filled with microspheres carrying allergenic proteins. When injected into the body, these microspheres gradually release the proteins over three months, decreasing the frequency and number of allergy shots required by his patients.

**"If you have a wonderful discovery like Chu's, you also need the clinical perspective provided by these collaborations to know where it can be used."**

—Dr. William Reisacher

For his delivery agent, Reisacher relies on FDA-approved polyglycolic-lactic acid (PGLA), commercially available polymers that have been in use for more than 20 years. They are biodegradable, but trigger an inflammatory reaction in the body. As an alternative, Chu and Reisacher are testing Paclitaxel-loaded PEA microspheres as a delivery agent. These "self-degrading" polymers offer programmable release rates while muting the body's inflammatory response. Early lab tests have been promising, and the two scientists are now moving the product toward animal testing.

"The clinical needs really drive the further development of these polymers," said Reisacher. "If you have a wonderful discovery like Chu's, you also need the clinical perspective provided by these collaborations to know where it can be used."

## Positive polysaccharides kill cancer cells

Chu's many collaborations with WCMC partners have opened the door for another valuable research opportunity with Dr. David Nanus, the Mark W. Pasmantier Professor of Hematology and Oncology in Medicine and the co-chief of the Division of Hematology and Medical Oncology at WCMC.

During a surgical retreat between Weill and Ithaca-based scientists and engineers supported under the Morgan Tissue Engineering Initiative, Chu learned that cancer cells have more negative charge characteristics on their cell membranes than do normal cells. Through his earlier work on DNA capture and release for the gene transfection study, Chu had developed a novel cationic, water soluble, and nontoxic member of the pseudo-protein family for capturing DNA, which also carries a negative charge. When Chu and Nanus combined efforts with the help of the Seed Grants for Intercampus Collaborative Research Cornell Prostate Cancer Research Group, they discovered that Chu's newly developed positively charged polysaccharides selectively bound to the negatively charged cell membrane of prostate cancer cells, killing the cancer cells in the process.

Tissue studies conducted by Nanus have confirmed that when certain new polysaccharides developed in Chu's lab are delivered in specific concentrations, they can indeed selectively kill prostate cancer cells without harming normal cells. "Instead of the indiscriminate killing of cells caused by chemotherapy or radiation," Chu said, "these tailored-designed polysaccharides at the right dosage appear to selectively attack the prostate cancer cells."

Chu believes that this new finding may be extended to treat enlarged prostates, though actual clinical use is years away with the need for extensive animal and clinical trials. Nanus and Chu are preparing to publish their findings and hope to complete a more extensive study down the road.

"Publication, patents, and partnerships are the three 'Ps' that are the hallmark of my multidisciplinary research program," Chu said. Each moves Chu's groundbreaking discoveries one step closer to medical practice, where they can help patients in need of potentially life-saving or therapeutic technologies. • • •

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**A novel nutrition program nourishes HIV-positive mothers and their babies by bridging the gaps between clinic and community.**

# High-Risk **in Haiti**

BY MARISSA FESSENDEN

*Cornell nutrition researchers Elizabeth Fox (second from left) and Rebecca Heidkamp (second from right) with GHESKIO workers (l-r) Suzette Fleury, nutrition program assistant; Adeline Bernard, nutrition program assistant; and Ghislaine Saint Louis, nutrition counselor.*

Mona Maitre was worried. One of her patients, a homeless woman, had not shown up for her appointment. Maitre fretted about the woman, who was HIV positive, and the woman's baby. They both needed medicine, food, and support. Each morning, Maitre drove around Port-au-Prince, Haiti—a vast, sprawling city—to scour the streets for the missing woman and her child.

When Maitre, a nurse at Cornell's GHESKIO clinic, a center for the treatment of HIV/AIDS and related infections in Port-au-Prince, eventually found the woman, she discovered the baby had a serious respiratory infection.

The nurse's dedication and concern may seem unusual, but Rebecca Heidkamp, a Ph.D. candidate in the Division of Nutritional Sciences in the College of Human Ecology, said it is exemplary of how the clinic cares for the community. "For many of the staff, it is not about the data or the challenges faced in the clinic," Heidkamp said. "It is about caring for people."

Heidkamp spent three years at GHESKIO working on her doctoral thesis, where she designed and implemented an innovative program to meet the nutritional needs of HIV-infected mothers and their babies. Their multi-faceted approach educates these women about the importance of nutrition during a child's first two years of life, offers "mothers' clubs" where the women share advice and connect to the larger community, and provides nutritional supplements for their children. The program, overseen by nutritional experts in Human Ecology and clinical physicians at Weill Cornell Medical College (WCMC), is now in full swing and showing promising results as a behavioral intervention for high-risk mothers.

GHESKIO sees about 300 HIV-positive pregnant women a year. Under the new nutrition program, they meet monthly in a mothers' club and receive one-on-one medical care from clinic pediatricians and nurses. The mothers are grouped according to their babies' ages.

"For example, when the baby is 7 months old, we talk about diarrhea, which starts to be a problem at that age," Elizabeth Fox '09 explained. Fox, a nutritional sciences graduate, currently supervises the program in Port-au-Prince while Heidkamp finishes her thesis.

Working in a developing country with limited resources is not easy. Even before the catastrophic 2010 earthquake that flattened buildings in Port-au-Prince and throughout the region, work in Haiti presented some unique difficulties.

"Food insecurity is a big problem," explained Vanessa Rouzier, head of the pediatric department at GHESKIO. > > >

*A mother and child visiting the clinic.*

*A group of Haitian mothers and their children meet with clinic workers during a mothers' club session.*

"When the parents ask for money and beg for food, you are tempted to give it to them for the children. We want to empower the community. Our mission goes beyond being a charitable organization."

GHESKIO formed in 1982, the first institution in the world dedicated to combating the newly described HIV virus. Jean W. Pape, the founding and current director of GHESKIO and professor of medicine at Weill Cornell, along with a group of Haitian colleagues, noticed young men in Haiti dying of unusual opportunistic infections. With Warren Johnson, professor of medicine at WCMC, Pape and his colleagues created the Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections (GHESKIO—a French acronym, pronounced guess-key-o) to describe and combat what would be later recognized as HIV/AIDS.

Despite operating in a resource-poor country, GHESKIO has led the way in developing therapies for the major complications of HIV, including tuberculosis and diarrhea. The center's mission has expanded to include community development, with the nutrition program bridging gaps between clinical care and community-level connection.

## New focus on maternal-child nutrition

When Johnson and his colleague Dan Fitzgerald heard about the work of Rebecca Stoltzfus, professor of nutrition in Human Ecology and co-founder of the Global Health Program, they knew that she should visit Haiti. Stoltzfus's research focuses on the causes and treatment of malnutrition in women and children in developing countries.

"They were providing state-of-the-art HIV care at the clinic," Stoltzfus said, "and doing a very good job of protecting children from HIV transmission from their mothers. But they said that they were really doing little in terms of nutritional support." Stoltzfus decided to take Heidkamp, a new Ph.D. student in her research group, down to Haiti.

"GHESKIO has an excellent reputation locally," Heidkamp said, "and is backed by strong science and cutting-edge research. So we were able to come in with a different perspective and say, 'How can we make the clinical world seem more like a community?'"

GHESKIO already provided formula for children ages 0–6 months, but no nutritional support for the latter part of infancy. Children are very vulnerable to malnutrition and illness for the first two years of their life; their nutrition at that time has an enormous effect on their cognitive and physiological development.

It was hard for Haitian mothers to get sufficient amounts of high-quality food for their children, often feeding them thin, grain-based gruels before children are ready for solid food. The World Health Organization recommends breastfeeding, which can provide up to 50 percent of the caloric

**"For many of the staff, it is not about the data or the challenges faced in the clinic. It is about caring for people."**

—Rebecca Heidkamp

requirements, with supplemental foods for ages 6–24 months. When the GHESKIO study began, however, HIV-positive mothers were encouraged to use formula to avoid the risk of HIV transmission.

New evidence has shown that anti-retroviral drugs actually reduce the likelihood of transmission of HIV through breast milk. Heidkamp's program educated mothers about formula and breastfeeding and provided a dietary supplement called Manba Fotifye, a Haitian-produced, fortified peanut paste supported by a St. Louis–based nonprofit organization, Meds and Foods for Kids. Heidkamp saw a dramatic reduction in stunting and wasting in the children of mothers in this program compared to children who had visited the clinic the previous year.

"It wasn't only the provision of food, but provision in a group context and counseling about infant feeding and infant health," Stoltzfus explained.

Fox found that the mothers' clubs are the most powerful aspect of the program. For many mothers, especially HIV-positive women whose own families may not know their status, the clubs create a safe place where they can ask questions and foster a sense of community and belonging.

GHESKIO's team of nurses, physicians, and community health workers are the heart and soul of the center. Heidkamp's team included nurse Mona Maitre who searched for her missing homeless patient, counselor Ghislaine Saint Louis who once drove more than an hour from the clinic on her Saturday off to meet a woman who was missing her clinic visits because her husband was in jail, and Suzette Fleury and Adeline Bernard—all women whose impressive dedication made the program a success.

## Expanding its reach and mission

The success of Heidkamp's study was so impressive that it is now a permanent program at GHESKIO, expanded to include HIV-affected children from birth to 2 years old and a community outreach program for those affected by the earthquake.

The challenges that the program faces are many. Even before the earthquake, the center was pressed for space. Now, with a refugee camp of more than 7,000 people living almost on the doorstep of GHESKIO, the needs of the community are even more urgent. The nutrition program faces increased demand for space and funding.

"We are in the late planning stages for a nutrition center for maternal-child health on the campus at GHEKSIO," said Johnson. "The center will expand the nutrition services we provide and further the mission of how best to approach nutrition problems in Haiti and around the world."

For the past 30 years, GHESKIO has been a leader in the fight against HIV/AIDS in the developing world. With the establishment of the Millennium Goals by the United Nations, global attention and funding have increased for problems of malnutrition, tropical diseases, and HIV. GHESKIO remains uniquely poised to make a difference on those fronts.

Now the nutrition program is continuing and extending GHESKIO's work.

"It is very exciting for us to have an opportunity to work with the world-class nutrition team they have at Cornell," Johnson said.

"The real reward is when you see children who respond beautifully and you really change a life," said Rouzier. "That makes the challenges worth it." • • •

*A child eats a mix of mangoes, bananas, and eggs during a lesson to instruct kids how to feed themselves.*


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***Researchers ally with local churches and clinics to reduce obesity in some of New York City's poorest neighborhoods.***

# *Tipping the Scales*

***BY TED V. BOSCIA***

For two years running, the Bronx has attained an unwelcome distinction: the unhealthiest of all 62 counties in New York. High rates of adult and childhood obesity, especially in the South Bronx, have helped plunge the borough to the bottom of the findings by the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute. A few miles west, across the Harlem River, the proportion of overweight and obese residents in Central and East Harlem is similarly high—about 6 in 10 adults and more than 4 in 10 children.

As a result, these low-income neighborhoods, largely African American and Latino, show disproportionately high rates of hypertension, heart disease, stroke, diabetes, and a host of other chronic health conditions related to poor diets and sedentary lifestyles. Perhaps most distressing, however, are the environmental, cultural, and economic influences that promote obesity in these neighborhoods: a surplus of fast food restaurants and a shortage of fresh produce and other healthy options; limited access to parks and affordable recreation; and unusual work, family, and social strains.

"The odds are truly stacked against a lot of people," said Erica Phillips-Caesar, M.D., M.S., assistant professor of medicine at Weill Cornell Medical College (WCMC). "It's no surprise that obesity is an epidemic and a huge public health concern in these places."

Through a novel alliance with local churches and health clinics, a multidisciplinary team of Human Ecology and Weill Cornell investigators are striving to reverse the odds and reduce obesity and obesity-related deaths in black and Latino adults in Harlem and the South Bronx. The Small Changes and Lasting Effects (SCALE) project, funded by a $6 million grant for Obesity Related Behavioral Intervention Trials from the National Heart, Lung, and Blood Institute, seeks to nudge residents toward healthier diets and increased physical activity > > >

*SCALE community health workers Tori Velez (left) and Yvonne Meade-Clemente are helping Harlem and South Bronx residents to adopt healthier habits.*

through minor lifestyle changes. The study, led by Dr. Mary Charlson, the William T. Foley Distinguished Professor of Medicine at WCMC, includes a broad group of researchers: Phillips-Caesar; Human Ecology faculty members Elaine Wethington, associate professor of human development and of sociology, and Carol Devine, professor of nutritional sciences; Brian Wansink, the John S. Dyson Endowed Chair of Marketing in Cornell's College of Agriculture and Life Sciences; and Martin Wells, the Charles A. Alexander Professor of Statistical Sciences in Cornell's School of Industrial and Labor Relations.

The team is concluding a pilot study of 115 participants, which will inform full-scale trials set to begin later this summer. Participants are asked to select a small-change eating approach—such subtle strategies as filling half their plates with fruits and vegetables or switching to smaller dishes to control portion sizes—to try for 12 weeks. They pair this approach with a tactic to get more exercise—exiting the bus two stops early and walking, for instance. The researchers are aiming for a 7 percent or more weight reduction in participants.

In his Food and Brand Lab on the Ithaca campus, Wansink has demonstrated how his small-change eating techniques have led to sustained weight loss in research participants. SCALE is attempting to translate these successes into people's communities and homes—places where many factors are steering them toward overweight and obesity.

"Diets are restrictive and demanding and force people to make large sacrifices," said Devine. "Small changes, on the other hand, have the potential to form into sustainable habits that take hold for a long time. This is a test of whether what works in the lab can be effective in people's homes."

**"Small changes . . . have the potential to form into sustainable habits that take hold for a long time. This is a test of whether what works in the lab can be effective in people's homes."**

—Carol Devine

## Gaining trust neighbor to neighbor

When she first entered Harlem-based health centers to recruit people for SCALE, Tori Velez encountered deep skepticism. People scoffed at the idea of loading up on fruits and vegetables. "They would tell me, 'I don't eat salads, that's rabbit food,'" she said. "It's hard for them to consider making a change."

Velez, operating out of the Northern Manhattan Perinatal Partnership, a venerated community health organization in Harlem, also found that people were unsure about committing to participate in research. With one woman who ultimately enrolled, Velez spent 30 minutes on the phone and an hour in person reviewing the SCALE consent form. "We went over it line by line," she said. "When you educate them about the study and they see your excitement, people start to open up."

Velez is one of three specially trained community health workers and research assistants who are "really pivotal" to SCALE, according to Phillips-Caesar. Along with the partnering churches and health centers, they are helping to put the community at ease, calming a wariness among many minority groups about medical research that goes back to the infamous Tuskegee syphilis experiments.

"Even though we're not asking anyone to take a drug or try something radically different in SCALE, it's still invasive," Phillips-Caesar said. "We're coming into people's lives and homes, asking them personal questions, and trying to get them to change their behaviors. The community health workers are on their level, with names and faces they know and recognize. It breaks down the initial fear over signing a consent form and agreeing to a study."

Participating churches, such as St. Luke's Roman Catholic Church in the South Bronx and First Baptist Church in Harlem, play a key role in recruitment by hosting health screenings. Beyond that, they help set the broader health agenda for their congregations and will be critical to disseminating the findings when SCALE concludes. In one case, a local pastor enrolled in SCALE, hoping to be a model for his flock.

"The churches are at the center of many people's lives," Phillips-Caesar said. "They know their communities best and what people will respond to."

Similarly, local health centers, including Lincoln Medical and Mental Health Center in the South Bronx and the Renaissance Health Care Network in Harlem, provide research support and aid in recruitment. Along with the churches, they have also assisted in study design as the SCALE team refines its approach.

"Our focus is on developing interventions that can be easily translated to the community," Phillips-Caesar said. "We have found that you must get the community involved in the early stages and throughout the study to have any success."

Yvonne Meade-Clemente is another of the SCALE community health workers. A native of Panama, she's lived in New York City for decades and considers it her home. SCALE is her first opportunity to work in public health, and she relishes the chance to help her neighbors to adopt healthier habits.

"I'm part recruiter, part cheerleader," said Meade-Clemente, who seeks out participants at local churches and checks in with them weekly to track their progress. "I'm very compassionate, I want to help. It's very rewarding to me when I see people stick with it and make these small changes and come out losing weight. The look on their faces when they step on the scale and see the results is the best part."

## Adapting research to the real world

Not all SCALE participants may see the pounds melt away, however. Eating from smaller plates may work in a controlled research setting, for instance, but the theory is challenged by environmental factors and stressors in people's neighborhoods and homes that can disrupt good intentions.

Wethington, a medical sociologist and SCALE principal investigator on the Ithaca campus, is investigating how everyday stressors—such as marriage strains, financial struggles, unemployment, and crime—interfere with the intervention. A noted expert on how people respond to




*ABOVE: SCALE community health workers recruited study participants at health fairs like this one at St. Luke's Roman Catholic Church in the South Bronx.*

*RIGHT: SCALE researchers (l–r) Laura Smith, Erica Phillips-Caesar, Mary Charlson, Carol Devine, and Elaine Wethington meet with Human Ecology Dean Alan Mathios.*

psychosocial stress, she is using standard quantitative measures to document its effect. "Understanding the impact of these factors will be essential to designing an effective intervention," Wethington said.

Along with WCMC's Charlson, Wethington is also examining how daily self-affirmation techniques can buffer against the adverse behavioral impacts of stress exposure. The work flows from Charlson's longstanding research interest in how people can overcome the barriers to healthier behaviors.

"By joining with Weill, our college can more effectively assess medical outcomes and real-world health impacts," Wethington added.

Through SCALE, researchers also hope to gain insights into how social networks—friends, family, and church and community groups—can help or hinder one's ability to adopt these small changes. Johanna Carroll, a nutritional sciences doctoral student in Human Ecology, has created survey questions to examine how social connections influence participants' behaviors throughout the study.

"The assumption is that your family and friends will be supportive and provide the motivation and assistance to help you lose weight," said Carroll, who developed the questions with her advisor, Carol Devine. "But it could also be that they are tempting you with old habits and behaviors that are hard to break."

Carroll has visited New York City twice to aid the community health workers as they conduct "close-out" interviews at the pilot study's conclusion. They work through Carroll's questions, part of a larger survey developed by the SCALE team, to gauge how the intervention unfolded in their homes.

"We are gathering important data," said Carroll, "but people also start to see that we are not just academics interested in dropping in to do a study and then leaving. It's translational because we hear directly from them about what works and what doesn't and then use that feedback to shape the intervention."

For Carroll, an African American, the SCALE interventions to treat and prevent obesity take on special significance. She lost both of her grandparents to nutrition-related diseases at a young age and wants to address the health disparities prevalent in many minority communities.

"Obesity is a major public health problem driven by lots of complicated factors," she said. "What's great about SCALE is that we are taking findings directly into the community and working with people to come up with solutions. We may not be able to change everything that is contributing to these disparities, but there are still lots of steps we can take to improve people's lives right now and hopefully over the long run." • • •

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# Fast Tracking Research from **Basic to Bedside**

U.S. biomedical research faces a serious problem: It takes far too long—up to 17 years by conservative estimates—to move new ideas from basic research into medical practice. The slow crawl of innovation means longer waits for patients who need potentially life-saving treatments and therapies.

William Trochim, professor of policy analysis and management and director of evaluation at the Weill Cornell Clinical and Translational Science Center, is leading Cornell's efforts to accelerate the delivery of promising findings from bench to bedside. Established in 2008 with a $49 million Clinical and Translational Science Award (CTSA) from the National Institutes of Health, the center joins a national consortium of medical research institutions trying to overcome delays in the research process.

"Congress and our society see huge investments we have made in research in the past and are asking why so little of it actually gets used," Trochim said. "The problem is we have different systems for basic research, clinical research to test new innovations in humans, and medical practice, where treatments actually reach patients and improve public health. We need to find ways to have these systems work more effectively together."

Cornell researchers, along with CTSA partners across the country, are creating interdisciplinary teams early on, identifying the best practices for managing clinical trials, and investigating ways to synthesize new information more efficiently. Trochim monitors Cornell's efforts, regularly sharing his findings with hundreds of CTSA researchers.

**William Trochim**
Professor of Policy Analysis and Management
Director of Evaluation for the Weill Cornell Clinical and Translational Science Center
Director of Evaluation for Extension and Outreach for Cornell Cooperative Extension

**Weill Cornell Clinical and Translational Science Center**

Grant: $49 million over five years from the National Institutes of Health, with the option to renew.

Principal Investigator: Dr. Julianne Imperato-McGinley, the Abby Rockefeller Mauzé Distinguished Professor of Medicine in Endocrinology, Diabetes, and Metabolism and associate dean for educational training and translational research at Weill Cornell Medical Center.

Director of Evaluation: William Trochim, professor of policy analysis and management at the College of Human Ecology.

Cooperative Extension Director: Don Tobias, executive director of Cornell University Cooperative Extension—NYC.

*Bill Trochim*

"Without that role, these centers would be driving with a blindfold on," he said.

To date, Cornell researchers have identified several main reasons that contribute to the delays.

First, basic researchers often focus on specialized areas and may struggle to connect with scientists outside their disciplines, resulting in minimal cooperation between basic researchers and the clinicians who will test their ideas and the practitioners who will use their discoveries with patients.

Once it's time to test new treatments, clinical trials are beset by numerous obstacles in recruitment and retainment. (According to one estimate, some 70 percent of ongoing clinical trials in the U.S. will never be completed because they are unable to recruit adequate participants.) Finally, for innovations that advance past clinical trials, it takes about nine years to synthesize the results of multiple studies and summarize the findings in a format that can be used by medical professionals.

"We are talking about a problem that is fundamentally rooted in people and systems, so it makes perfect sense that Human Ecology is working at the center of it," Trochim said. "What happens after researchers at Weill Cornell publish these studies that come out over the course of their career? I am looking at all of the steps in the process."

In his role, Trochim is also actively seeking ways to connect researchers on Cornell's Ithaca and New York City campuses to speed along biomedical innovation.

"This is very much a cross-campus initiative," he explained. "And that's important. It is going to take a lot of people working in a lot of areas to address these problems." • • •

# PAM Faculty to Head New Institute on Health Policy

Two Policy Analysis and Management (PAM) professors are working to build a "community of scholars" from campus and visiting institutions focused on risky health behaviors and their implications for health care policy and public health.

The Institute on Health Economics, Health Behaviors, and Disparities, co-directed by professors John Cawley and Donald Kenkel and set to launch July 1 with funding by the College of Human Ecology, is intended to attract scholars from a wide range of fields related to health policy, including economics, government, nutrition, communications, sociology, psychology, and medicine.

Cawley and Kenkel envision the new institute as a home for research and evaluation that informs public debate, serves as a structure to mentor and support graduate students, and coordinates Cornell's expertise in these areas.

"Health economics, health behaviors, and disparities are inherently multidisciplinary issues," said Cawley, noted for his research on the economics of obesity. "If you want to understand the factors that lead to risky health behaviors, as well as possible policy solutions, you need to get economists, sociologists, public policy experts, nutritionists, and communications researchers all talking to each other. This institute is very much in the spirit of Human Ecology, where we take insights from various disciplines to work on common goals."

The collaborative approach is necessary, Kenkel said, because public health concerns pervade many areas of society and public policy. In coming years, for instance, various health care reforms will start to reshape medical benefits programs offered by the state and federal government, employers, and private insurers.

Smoking and obesity, two of the foremost preventable health problems in the United States, endanger individual health but also add great costs to the U.S. health care system. In addition, prescription drug regulations are increasingly complex.

"The institute will take a broad perspective and seek to examine the factors that play into individuals' health decisions and behaviors," said Kenkel, who specializes in the economics of disease prevention and health promotion. "It will also be a place for investigation of research claims and policy proposals. There are lots of competing approaches for smoking cessation, for example, so the institute will try to define what is most effective in areas such as this."

*John Cawley (left) and Donald Kenkel*

Cawley and Kenkel said the institute, which will be part of the Cornell Population Program, will offer an infrastructure to support new research by graduate students and to connect them with key faculty across campus and up to a dozen visiting scholars each year. Through the institute, students could also access relevant data sets and administrative support for research projects.

"We want faculty and students to be able to easily navigate these subjects and to pursue the research avenues that interest them," Cawley said. "We hope the institute will also shine a light on Cornell's wide-ranging expertise in these areas."

In addition to college support, the institute will benefit from National Institutes of Health grants and other funds from agencies that are currently backing Cawley's and Kenkel's research. • • •

# Service with a Smile—

## Sloan Initiative Helps Weill Cornell Neurosurgery Raise Patient Satisfaction

Many patients know the frustration of rushing to a doctor's appointment, then sitting in a waiting room as they watch the minutes tick by. Maybe they make it straight to the exam room—and then wait there without so much as a magazine for distraction. But what if someone popped in and offered them a cup of coffee? Or apologized for the wait, said the doctor was on an emergency call, and offered them a pager so they could take a stroll and get buzzed when it's time for their appointment?

That's the kind of innovative customer service that Sloan Program in Health Administration students, under the direction of associate professor John Kuder, have helped introduce to the Department of Neurological Surgery at Weill Cornell Medical College (WCMC). The partnership was formed in 2008 with a modest goal: putting some hospitality back into the hospital.

"Hospitality isn't limited to a particular industry," said Richard Paddy, WCMC neurological surgery department administrator. "The health care setting is a place where it should exist."

Paddy admits that it's hard to make major invasive procedures, like brain surgery, "hospitable." But between a patient's initial visit and an operation, there are myriad interactions with clinicians and support staff; much can be done to make the journey as pleasant as possible. Hence Paddy's efforts to set a "platinum standard" for patient care with guidance from the College of Human Ecology's Sloan Program and the hospitality gurus at Cornell's School of Hotel Administration.

Weill Cornell doctors in neurological surgery typically see 5,000 new patients a year, of which about 2,000 are surgical cases. The department has 11 surgeons, 10 "physician extenders"—such as nurse practitioners and physician assistants—and 37 support staff. Paddy said that patient feedback on customer service surveys in the past was above average, but not ideal. Since they've introduced the customer service program, however, those surveys are improving.

Kuder and four Sloan students produced a customer service manual for support staff that outlines goals and performance standards. The emphasis is on courtesy at all levels: handling patient phone calls, doing admissions, sending email, and contacting clinicians.

"Our relationship with the Department of Neurological Surgery has been part of Sloan's emphasis on giving our students both a rigorous academic preparation and practical experience solving real health care problems," Kuder said.

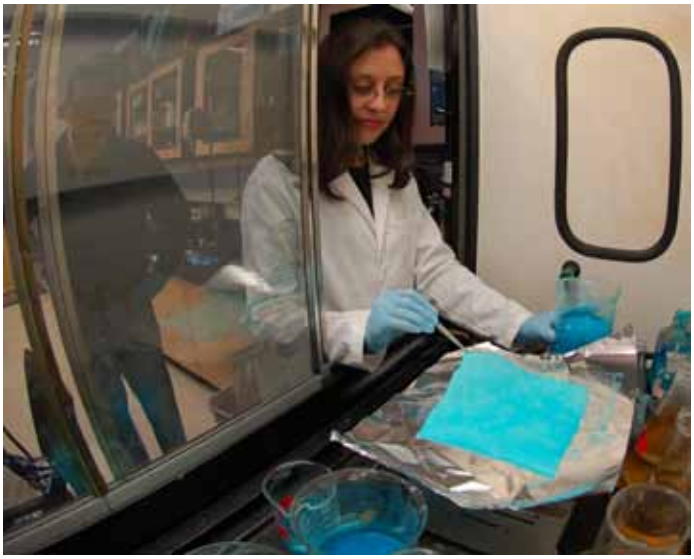
In 2009, Sloan graduate Colin Nash '10 spent a summer improving the department's customer service program and collecting data to create performance guidelines for clinicians. Much of his time was dedicated to interviewing medical staff, with a focus on time management, to discover causes of patient lag times in waiting and exam rooms. More Sloan students have since carried forward Nash's work through capstone projects and summer internships. Next up: a plan for a "virtual department" that uses computer and communications technology to meet patient needs.

It's not unusual for neurosurgeons to be called away for emergencies that can derail schedules. To improve the patient experience, the department now offers a "service recovery kit," which might include a voucher for coffee in the cafeteria. For patients whose wait is expected to be lengthy, staff offer a pager; if patients opt to stay, there are games, crosswords, and Sudoku to keep them entertained. "This is truly an innovative program," said Deborah Als, the department's clinical practice manager.

*—Franklin Crawford*

*Editor's Note: This article has been adapted from* Weill Cornell Medicine *magazine.*

*Colin Nash (left), Sloan '10, who researched ways to improve the patient experience at the WCMC neurological surgery clinic, consults with department administrator Richard Paddy.*



*Postdoctoral associate Marcia Da Silva Pinto led the work to coat fabrics with metal organic molecules (MOFs).*

*Allie Thielens models the gas-absorbing hood and mask designed by Jennifer Keane.*

# Fiber Science Lab, Design Student Develop Clothes to Trap Poisonous Gas

A new fabric that can selectively trap noxious gases and odors has been fashioned by Jennifer Keane '11, a fiber science and apparel design (FSAD) major, into a line of hooded shirts and masks inspired by the military.

The garments use metal organic framework molecules (MOFs) and cellulose fibers that were assembled in assistant fiber science professor Juan Hinestroza's lab to create the special cloth. MOFs, which are clustered crystalline compounds, can be manipulated at the nanolevel to have cages that are the exact same size as the gas they are trying to capture.

Keane worked with Hinestroza and FSAD postdoctoral associate Marcia Da Silva Pinto to create the gas-absorbing hoods and masks. Some of the basic science behind this project was funded by the U.S. Department of Defense.

"The work to meet the initial goal of attaching the MOFs to fibers was sponsored by the Defense Threat Reduction Agency. We wanted to harness the power of these molecules to absorb gases and incorporate these MOFs into fibers, which allows us to make very efficient filtration systems," Hinestroza said.

Da Silva Pinto first created MOF fabrics in Hinestroza's lab, working in collaboration with chemists from Professor Omar Yaghi's group at the University of California–Los Angeles. Yaghi is one of the pioneers and leaders of MOF chemistry, Hinestroza said.

At first the process did not work smoothly. "These crystalline molecules are like a powder that cannot easily become part of cloth," Da Silva Pinto noted. After months of trying to attach the particles to the fiber, "the researchers realized that the key was to bring the fiber to the particle—it was a real paradigm shift," she said.

"Now we can make large surfaces of fabric coated with MOFs, and we are looking at scaling up this technology to nanofibers," Hinestroza said. "This type of work would only be possible at a place like Cornell where you have this unique merging of disciplines, where a fashion designer can interact easily with a chemist or a materials scientist."

Though trained as a chemical engineer, Hinestroza said he likes to work with designers because they think very differently than scientists. "I love that because that's where the real creativity comes from, when you have this collision of styles and thinking processes."

Keane, who took Hinestroza's Textiles, Apparel, and Innovation course, said she started Cornell as a pre-med major but switched to FSAD because she enjoyed the creative aspect of sewing and designing her own clothing in high school. She has since interned with Nike and recently received a job offer from Adidas.

Keane's MOF garments were displayed in an exhibit at Martha van Rensselaer Hall and at Mann Library. Keane also created a line for the 27th annual Cornell Fashion Collective spring fashion show on April 16. Her women's sportswear collection included many geometric patterns and bright jewel tones.

***—Elizabeth Simpson '14, a writer intern for the* Cornell Chronicle**

# Afterword

## Bronfenbrenner Center for Translational Research: Forging closer links among research, practice, and policy

BY JOHN ECKENRODE

This fall, the College of Human Ecology will open the Bronfenbrenner Center for Translational Research (BCTR), an initiative that will merge two longstanding and successful college centers: the Family Life Development Center and the Bronfenbrenner Life Course Center.

The BCTR will place the college in the vanguard of one of the most dynamic and exciting recent developments in the scientific community—translational research as a means to link research with outreach and education. The BCTR will operate as a "living laboratory" for the extension of research-based knowledge into practice and policy settings and for the incorporation of problems from those domains into researchers' agendas.

In the spirit of its namesake, Urie Bronfenbrenner, the new Bronfenbrenner Center will bridge the gap between research and practice, helping Human Ecology to solve a problem that exists both at Cornell and in society at large. Too often, practitioners view research as esoteric and irrelevant, while researchers perceive application as trivial and unscientific.

Science can help solve many pressing human problems, yet much research is never used. Many programs intended to benefit children, youth, elders, and families are not scientifically tested, and insights from basic research are rarely used systematically to guide the development of new programs. When research is translated into practice, the process is too slow. It is precisely these problems that translational research is intended to address and this is where the BCTR will make unique contributions.

We aim to make Cornell a nationally recognized leader in the translation of social and behavioral science into practice and policy. The initiative will build on cutting-edge research already in progress in the college and across Cornell in which social scientists are collaborating with clinical researchers, community agencies, and policy experts on studies designed to bring research findings to bear on improving health and well-being.

The BCTR will work closely with Cornell Cooperative Extension and the Cornell Office for Research on Evaluation, and build on established links to the Cornell Edward R. Roybal Center for Translational Research on Aging, Weill Cornell's Clinical and Translational Science Center, the Cornell in Washington program, and other Cornell research and training centers.

Examples of activities that will be promoted by the BCTR include:

- integration of translational perspectives into basic research, by encouraging innovative research designs with practical applications in mind, or by integrating practitioner perspectives that enhance effective translation.
- systematic reviews of the scientific literature to inform new research and guide practitioners and decision-makers.
- the development and rigorous testing of interventions to promote healthy development and change unhealthy trajectories.
- community outreach and community participation in behavioral science research on risk and protective factors, prevention research, and the development of interventions.
- research on the implementation, dissemination, and sustainability of evidence-based programs, practices, and guidelines.
- research and development on the translational process itself, studying how best to move research findings into practice and policy.
- community-based participatory/action research conducted in partnership with practitioners and stakeholders.
- engagement of undergraduates in BCTR projects and through coursework, as well as providing training opportunities for graduate students and postdocs.

We are at a critical juncture in the development of the social and behavior sciences and in their potential to solve pressing human problems. Over the past decade, major changes in research priorities, funding for the scientific enterprise, and extension and outreach have created a new environment with both serious challenges and exciting opportunities. Human Ecology is uniquely situated to take advantage of this novel situation. The BCTR will help to make the college a national and international leader in creating a new paradigm for rigorous scientific research that addresses human needs, breaks down traditional barriers between "basic" and "applied" science, and forges a closer connection between research and extension/outreach activities.

*John Eckenrode, professor of human development and director of the Family Life Development Center, leads the Bronfenbrenner Center for Translational Research initiative.*

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Roger Tully

## Partners in Research

During a two-day visit to Cornell's Ithaca campus this April, Dr. Andrew Schafer (left), chairman of medicine at Weill Cornell Medical College, shared ideas for research and academic collaborations with Human Ecology leaders Karl Pillemer (center), associate dean for extension and outreach, and Alan Mathios (right), the Rebecca Q. and James C. Morgan Dean of the College of Human Ecology. In subject areas ranging from public health to nutrition to tissue engineering, the two colleges are working together on many research endeavors.