

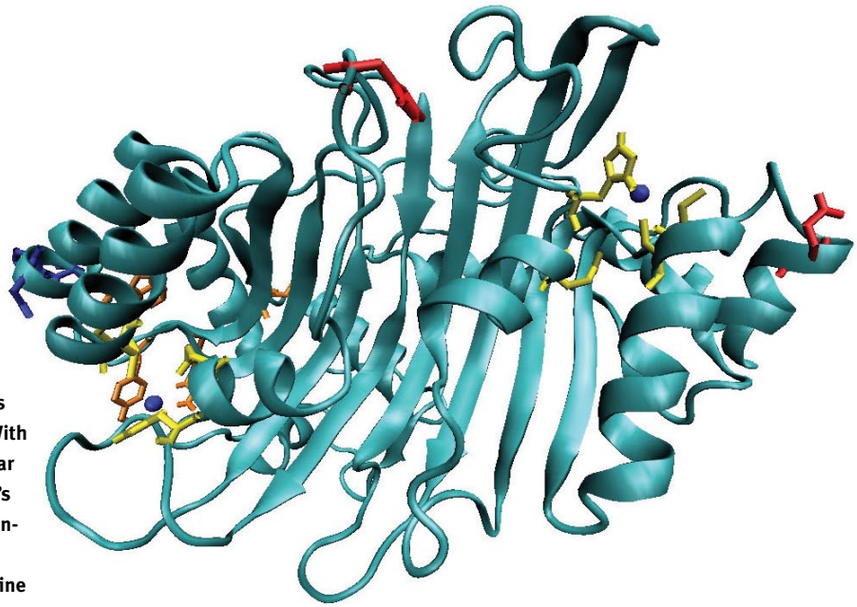
Devoted to noteworthy happenings

at the medical school

Understanding HIV

Scientists have a fairly good understanding of how HIV attaches to its host and gains entry into cells, says Angela Gronenborn, a PhD and the UPMC Rosalind Franklin Professor and chair of the Department of Structural Biology at the University of Pittsburgh.

However, what happens on a molecular and structural level when the virus invades remains a mystery. Sorting that out could lead to new drug targets. With this in mind, the National Institutes of Health bestowed a $16 million, five-year grant upon the School of Medicine. These funds will go toward the University's new Pittsburgh Center for HIV Protein Interactions, led by Gronenborn. The center uses nuclear magnetic resonance spectroscopy and X-ray crystallography (which employs scattered rays to determine the arrangement of atoms) to define protein structures. Other techniques, such as cryo-electron tomography, in which frozen virus is bombarded with electrons, help investigators focus on the interaction between HIV and the cell. Gronenborn hopes to identify moments when the virus becomes vulnerable to drug therapy. ***—Joe Miksch***



When does HIV become vulnerable to therapy?
ABOVE: A human cellular protein model

COURTESY DENISE CHAN AND LIN LIU

BIOFUEL

Ideas fuel biomedical research. So do dollars and cents. Recently released data show that the University of Pittsburgh ranks sixth in the nation in funding fuel, having received $447 million in National Institutes of Health support for the 2006 fiscal year.

In these lean funding times, the University is one of more than 3,400 entities receiving NIH support. Of those, Pitt is fourth in the total number of grants received, with 1,082.

FEEL THE PRESSURE

As of late 2007, there is a negative pressure zone on the University of Pittsburgh's campus, located on the eighth and ninth floors of Biomedical Science Tower 3. This is the new $28 million Regional Biocontainment Laboratory—one of 13 such labs in the country funded by the National Institute of Allergy and Infectious Diseases. Pitt's RBL, part of the School of Medicine's new Center for Vaccine Research, is the second to complete construction.

Open a door to a negative pressure lab and the air will rush in ahead of you. This simple biosafety measure helps to ensure that the dangerous pathogens under scrutiny—including those that cause SARS, dengue fever, and tuberculosis—will not escape on an errant breeze. A host of other safety measures and strict research protocols allows scientists here to work with highly infectious pathogens that occur naturally and also are potential bioweapons.

—Chuck Staresinic



SEAN GRAFF

A&Q

Of Mice and Men with Mario Capecchi

On October 8, the University of Utah's Mario Capecchi (shown above)—along with Oliver Smithies of the University of North Carolina at Chapel Hill and Sir Martin Evans of Cardiff University in Wales—netted the Nobel Prize in Physiology or Medicine. The Nobel Assembly recognized them for work that led to one of biomedical science's most important modern tools: knockout mice, those critters typically bred without certain genes, which are helping scientists understand more precisely how genetics affects health.

Four days later, Capecchi, a PhD and Distinguished Professor of Human Genetics and Biology as well as cochair of Utah's Department of Human Genetics, visited the University of Pittsburgh. He'd arrived to give a plenary lecture during Pitt's annual science festival, Science 2007. *Pitt Med* caught up with him to talk about his work and the future of basic science.

On starting big

We actually thought that we might be able to go all the way. It took us over 10 years to develop the means to do the work. It's not one of these occasions where you come stumbling into it. We had the vision, but it took quite a lot of technical know-how.

On the next generation of Nobelists

I think we're going to see a lot of progress regarding how the brain works. When we're talking, we can pull out a memory in a millisecond, but [functional magnetic resonance imaging] capture times are much slower. My guess is that [someone will improve capture time to] the level that will allow us to really start to understand what it means to pull out a memory.

On funding

This is an absolutely peak time to go into science, but then the ability to get funding is at the lowest spot ever. But funding is cyclical, so that will improve. This is actually a good time for scientists to come in, because by the time they're ready to get a job [the funding will be there].

His question for the scientific community

I think it is important for scientists to communicate with the public, [that's who] we're supporting in science. What can we, as scientists, do to improve communication with the public?

—Interview by Joe Miksch

Faculty Snapshots

Steven Kanter took the helm of the Association of American Medical Colleges monthly peer-reviewed journal, *Academic Medicine*, in January.

Kanter, an MD and vice dean of the University of Pittsburgh School of Medicine, has been a member of the journal's editorial board since 2005. *Academic Medicine* serves as a forum for medical schools and teaching hospitals to address pressing issues in the field.



Kanter

L. Dade Lunsford, director of Pitt's Center for Image-Guided Neurosurgery, was an honored guest of the Congress of Neurological Surgeons, a recognition bestowed upon one international surgeon a year.

Lunsford, an MD and the Lars Leksell Professor of Neurobiological Surgery in the School of Medicine and former neurosurgery department chair, is credited with helping the University of Pittsburgh Medical Center to become the first in the nation to use the gamma knife, a device for performing brain surgery without an incision, in a clinical setting. He was also recently named a 2007 Castle Connolly National Physician of the Year (one of three in the United States) and a University of Pittsburgh Distinguished Professor.



Lunsford

Judith Klein-Seetharaman was named the winner of the 2007 Margaret Oakley Dayhoff Award by the Biophysical Society. She is a PhD assistant professor of structural biology at the School of Medicine.

Named for a former president of the Biophysical Society, the award honors women considered to be on the verge of achieving prominence in their fields. Klein-Seetharaman's work focuses on membrane-receptor folding and misfolding and how these processes contribute to disease.



Klein-Seetharaman



Lewis

The Institute of Medicine has made David Lewis the 19th University of Pittsburgh faculty member to join its ranks.

Lewis, an MD, is the UPMC Endowed Professor of Translational Neuroscience in the Department of Psychiatry and a professor of neuroscience in the School of Arts and Sciences. He has spent his career researching schizophrenia. *—JM*

Think Like a Scientist

When the medical school first started requiring students to undertake a scholarly project four years ago, Vice Dean Steven Kanter had one concern.

"I didn't think it was fair to parachute a student into a lab, then airlift [her] out a number of weeks later," he says. So Kanter called on two University of Pittsburgh profs—Beth Piraino, an MD professor of medicine, associate dean of admissions and financial aid, and practicing nephrologist, and Peter Drain, a PhD associate professor of cell biology and physiology who studies ion channels in proteins related to diabetes. Kanter asked them to figure out how to teach med students to think like scientists.

The result was Methods and Logic in Medicine, a two-semester course that has already garnered national attention. It won an award from the Association of American Medical Colleges for innovation in preclinical education.

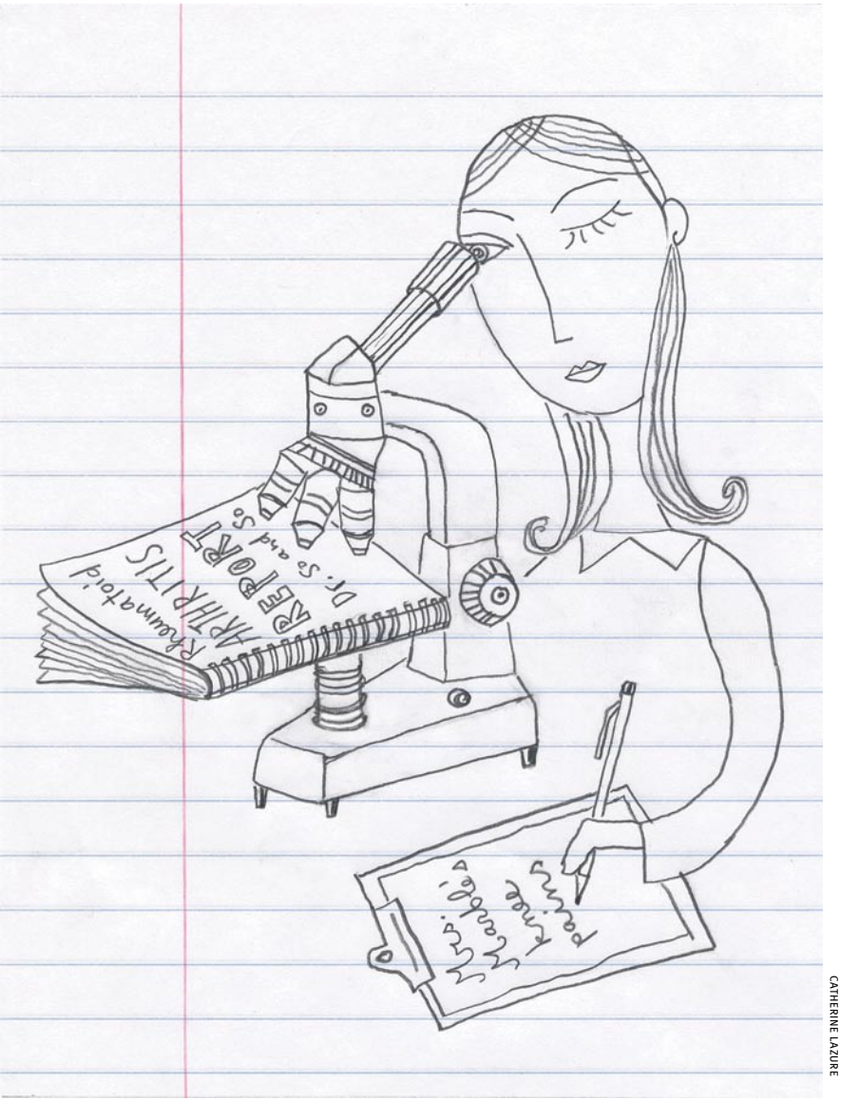
Working in small groups, first- and second-year students select published papers—on rheumatoid arthritis, say, or cytomegalovirus—and critique them. Is the sample size large enough? Are the samples random enough? Is the research question clear?

The course teaches the physicians-to-be how to drill down through the literature to find medical knowledge that can help them treat patients.

"The amount of information you're expected to keep up with as a physician is astronomical," says Piraino. "And you have to figure out how to do that and how to do that critically."

Piraino also brings patients from her own practice into the class. Students take medical histories, then locate research papers to help them propose treatments.

"It reinforces the medical cycle," says Drain. "You begin by defining the patient's problem, investigate it in the medical literature, then bring the relevant knowledge back to your treatment plan for the patient. We're teaching the students to develop this cycle throughout their lives as physicians." ***—Reid R. Frazier***



CATHERINE LAZURE





COURTESY B. BRANSTETTER

A CHIVALROUS LIFE

Barton Branstetter lives in a metaphor. The man's Marshall Township home is, well, a castle.

Branstetter (Res '00, Fel '01), an associate professor of radiology, otolaryngology, and biomedical informatics in the School of Medicine, and his psychiatrist wife, Cara McCandless (Fel '00), built their 7,000-square-foot medieval-style residence in three years and took up castle-keeping in January 2007.

The turreted, drawbridged, and moated structure is modeled on Bodiam Castle in southern England. Every now and again, the couple will have friends over for a grand feast in the great hall or a mock sword fight on the grounds.

"I am involved with medieval recreation because of the romance," Branstetter says. "It was really the romance of living in a castle and leading a chivalrous lifestyle that drew us to it." *—Sarah Evans*

FOR MORE INFORMATION:
www.pitt.edu/~caram/castleindex.htm



DAVID SCHROTT

DANCE REVOLUTION

Ever see those arcade games that show kids dance moves? Stephanie Studenski, professor of medicine, thinks they can get older Americans on their feet, too.

Studenski, a mobility and balance disorders geriatrician who once considered herself a klutz, has lost 47 pounds video-game dancing. "I dance every day and can't stop. I go and go and go," she says. She found the same was true for many of the participants in a National Institutes of Health–sponsored six-week pilot study of postmenopausal women.

It wasn't unusual for Studenski's study participants, who had agreed to dance for 30 minutes, to beg to continue once the half hour was up—they were so eager to get to the next level. These women had been unable to sustain much physical activity in the past.

Studenski suspects a longer study would confirm significant weight loss and perhaps improved physical and cognitive function among participants.

The women chose from hundreds of songs. One sure tune to get those feet moving: Gloria Gaynor's "I Will Survive." "You should see those women dance to that!" says Studenski.

Name Dropping

Carol Greider won this year's Dickson Prize in Medicine, the most prestigious award given by the University of Pittsburgh School of Medicine. During Science 2007, Pitt's annual fall science festival, she presented the Dickson Prize in Medicine Lecture on telomerase, an enzyme that maintains telomeres (terminal segments of chromosomes). Telomeres are vital to chromosomal reproduction and stability.

Greider, a PhD, is the Daniel Nathans Professor and director of the Department of Molecular Biology and Genetics at Johns Hopkins University. Her research attempts to understand the roles of telomerase and telomeres in chromosomal instability, cancer, and stem cell failure. She also is a recipient of the Albert Lasker Award for Basic Medical Research.

Laurie Glimcher visited Pitt during Science 2007 as well; she presented the Mellon Lecture. Glimcher is a professor of medicine in Harvard Medical School and the Irene Heinz Given Professor of Immunology at the Harvard School of Public Health.

The MD studies the development and activation of T helper cells, which are vital to the development of protective immunity and play a role in immune system malfunctions that underlie autoimmune diseases.

Mina Bissell delivered the Daisuke Nakada Memorial Lecture at the University of Pittsburgh Biomedical Graduate Student Association's 2007 research symposium in the fall. Bissell, a PhD and Distinguished Scientist in the Life Sciences Division at the Lawrence Berkeley National Laboratory in California, studies how the cell's scaffolding regulates genes in normal tissue and malignant tumors. *—JM*