Devoted to noteworthy happenings at the medical school... To stay abreast of school news day by day, see www.health.pitt.edu

Lauterbur Gets Nobel

In the early 1980s, when magnetic resonance imaging equipment first was used clinically, Paul Lauterbur attended a meeting of radiologists to explain applications of MRI technology.

After giving his presentation, Lauterbur overheard an older radiologist grumble, "I am glad that I am old enough to be retiring. Now I don't have to learn all this stuff."

"This stuff" changed the field of radiology, allowing doctors to have images of internal organs, tissues, and tumors. Today, approximately 22,000 MRI scanners are in operation worldwide, and about 60 million scans are performed a year.

Lauterbur, who received his PhD in chemistry from the University of Pittsburgh in 1962, remembers thinking there had to be a better way than exploratory surgery for doctors to examine tumors and organs. He was familiar with imaging techniques. In the '50s and early '60s while working at the Mellon Institute, Lauterbur studied the carbon-13 isotope with nuclear magnetic resonance (NMR), a technology mostly used by chemists to determine the structure of molecules by subjecting atomic nuclei to a magnetic field. Lauterbur was eating a hamburger at a Big Boy in New Kensington when he realized that NMR could identify the location of hydrogen nuclei to produce images of the body. It took years of experimentation before Lauterbur was able to develop the clinical technology that became known as MRI.

Last fall, the Nobel Assembly recognized Lauterbur's achievements, awarding him and Sir Peter Mansfield the Nobel Prize in Physiology or Medicine. The committee praised Lauterbur for adding gradients to a magnetic field, recording its emitted radio waves, and creating two-dimensional images of objects (his first images were of two tubes of water). The committee recognized Mansfield for improving the use of gradients, which produced a sharper image.

Lauterbur still applies imaging in his research at the University of Illinois in Urbana. He now uses NMR to try to determine how proteins contributed to the beginning of life on Earth. *—Meghan Holohan*

Paul Lauterbur (left) receives his prize from the king of Sweden

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FLASHBACK

Astronomer Percival Lowell insisted until his death in 1916 that his observations of Venus revealed dark spokes radiating from a hub on the planet's surface. Only last year, doctors realized that when Lowell narrowed the aperture of his 24-inch telescope down to three inches or less (to reduce the planet's brightness), he had created the world's largest ophthalmoscope, which cast the shadows of blood vessels in his own retina onto the image of Venus.

CAMI MESA

A&Q

Shanthi Trettin, on Fashion and Medicine

"I'm curious about a lot more than the physical body," says Shanthi Trettin (Class of '04). After five years at Pitt, Trettin (shown above) will graduate this spring with an MD and an MA in bioethics, as well as two area of concentration program certificates—in medical humanities and women's health. Her plans include clinical psychiatry, humanities research, and teaching in an interdisciplinary setting. A former immunology researcher, Trettin is one of only a handful of Pitt med students to complete a bioethics degree.

On why she studied fashion images as part of the research for her thesis

In thinking about those things that make patient care less effective and less compassionate than it could be, my question was: What's wrong with our whole culture? How is the separation between the mind and the body perpetuated, and what processes are involved in such dualism? That's why I look at fashion—which is an extreme of people being treated as objects, being fragmented, and being homogenized.

On her analysis of images of models in *Vogue* magazine

A lot of times faces are masked in these emotionless expressions, so there's a mind-body disconnect. That's an example of how the images are objects. … Sometimes the whole body is shown, but the shirt shows a little fragment of nipple, so the viewer's gaze is directed at that little fragment of the person. The body is framed in a way that the viewer's attention is on a fragment. … Homogenization is more obvious—every single model is tall and skinny.

On how Western dualism manifests itself in medicine

The biomedical model is reductionistic—it breaks individuals down into smaller and smaller categories; for example, you have your eye doctor, your heart doctor. So on one level, you're broken up into organs. People end up being defined by their problem or by their body part. … [Patients are homogenized] within their disease group and their population. So, assumptions are made based on someone being lesbian or heterosexual. Not all those things are bad—some are necessary in order to diagnose and treat disease. [What is lost in the biomedical model is] the inherent connection between different aspects of a person's life. [A person's] financial situation, religious beliefs, and broken knee may all be totally intertwined.

Her question for the world

As physicians, [how] can we better interact with our patients in a way that acknowledges the mind is connected with the body and the individual is necessarily embedded in his or her cultural context, including family environment, religious beliefs, economic situation, and social aspects? ***—Interview by Dottie Horn***

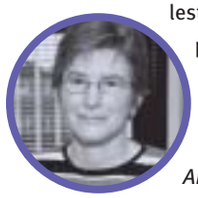
Faculty Snapshots

Schoen

More frequent screening for colon cancer could save lives, suggests a study by **Robert Schoen**, professor of medicine. The MD's study was published July 2 in the *Journal of the American Medical Association*. Schoen studied flexible sigmoidoscopy, a screening test used to examine the lower half of the colon; current guidelines recommend that the test be repeated every five years. Schoen studied more than 9,000 people who came back for a repeat flexible sigmoidoscopy after three years. A little more than 3 percent of the study participants had developed a nonadvanced adenoma (growth), while 0.8 percent had an advanced adenoma or cancer. His study raises questions not only about the frequency of screening with sigmoidoscopy but also about the 10-year interval that is currently recommended between colonoscopies, which examine the entire colon. Doctors may miss more cancer by examining the entire colon every 10 years than by examining half the colon every five years, he says.

A bone marrow transplant can cure sickle cell disease—but it has risks. Five percent of sickle cell transplant patients have died, largely because they become severely vulnerable to infection when chemotherapy destroys their native marrow. **Lakshmanan Krishnamurti**, assistant professor of pediatrics, and **Andrew Yeager**, professor of medicine and pediatrics, hope to develop a safer way to transplant bone marrow in sickle cell patients. They have begun a research study and plan to enroll 20 patients throughout the next five years. Participants will receive less than half the usual amount of chemotherapy prior to transplant. Their native bone marrow will not be wiped out entirely, so after the transplant, the doctors will administer higher doses of immunosuppressive drugs—which they hope will allow the native and donor marrow to reach a state of mutual tolerance. The doctors recently used their regimen while performing Pitt's first bone marrow transplant given in an attempt to cure sickle cell disease. Their patient, a 5-year-old boy, is doing well so far.

For years, doctors have reported that when patients are infected with HIV, their cholesterol levels drop. But when HIV-infected patients receive highly active antiretroviral therapy (HAART), their cholesterol levels rise. A new study by **Sharon Riddler**, assistant professor of medicine and an MD, shows that, after treatment with HAART, cholesterol levels return to about what they were prior to HIV infection. The rise after the initiation of HAART probably reflects the body's return to a healthier state. Her paper was published June 11 in the *Journal of the American Medical Association*. *—DH*

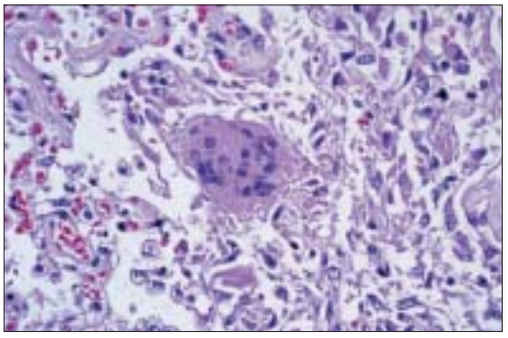


Riddler

Racing Against SARS

Even by modern standards, the speed with which the scientific community has attacked SARS (severe acute respiratory syndrome) is remarkable. Consider what occurred over two months last year. In February, the World Health Organization noted a few hundred cases of severe atypical pneumonia; the outbreak hit China, Vietnam, Singapore, and Canada. On March 17, the WHO mobilized a global network of laboratories to work collaboratively on the new disease. On March 24, scientists in Atlanta and Hong Kong isolated a new coronavirus from patients with SARS. On April 12, Canadian researchers announced they had successfully sequenced its genome.

At Pitt, the search for a vaccine began soon after, and it has yielded some tantalizing early results. In June, a Pitt professor of surgery and medicine, Andrea Gambotto of the Molecular Medicine Institute, along with others from the School of Medicine and the Graduate School of Public Health, produced an experimental vaccine by genetically engineering a common-cold virus to express three SARS genes. In July, they injected a group of rhesus macaques with the virus. Six weeks later, T-cells and antibodies against SARS were discovered in all of the immunized monkeys and none of the control group. Their results were published in a fast-track letter in *The Lancet* on December 6.



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The SARS virus. Gambotto has developed an experimental vaccine.

It's uncertain if this will lead to a vaccine for humans. Macaques don't present SARS symptoms, so the next step is to test the vaccine in animals that do get SARS. One possible pitfall: Some experimental vaccines actually enhance disease symptoms instead of preventing them. Gambotto's group needs to determine whether this is the case before even considering testing the vaccine in humans. *—Chuck Staresinic*

THE ROAD LESS TRAVELED

Ann Willman (Class of '08) sat in a clinic, talking with an ovarian cancer patient. "The experimental drug targets receptors on the cancer cells," she explained. As a clinical research coordinator at Dana-Farber Cancer Institute in Boston, Willman loved helping patients understand diseases and treatments. And patients seemed to appreciate becoming better informed and taking part in research. Those interactions eventually drew Willman to pursue a career in clinical, rather than basic, science research.

Willman is one of the first medical students to participate in the School of Medicine's new Clinical Scientist Training Program. She will study not only medicine but also biostatistics, clinical trial design, and research ethics. She'll work with a senior faculty member to develop her own research projects. With mentoring and support, Willman is expected to publish in peer-reviewed journals and present at national conferences. In five years, she'll graduate with an MD and MS in clinical research, as well as a head start on a road less traveled. Pitt started the Clinical Scientist Training Program partly because of the alarming national decline in the number of clinical researchers.

—Corinne Bechtel

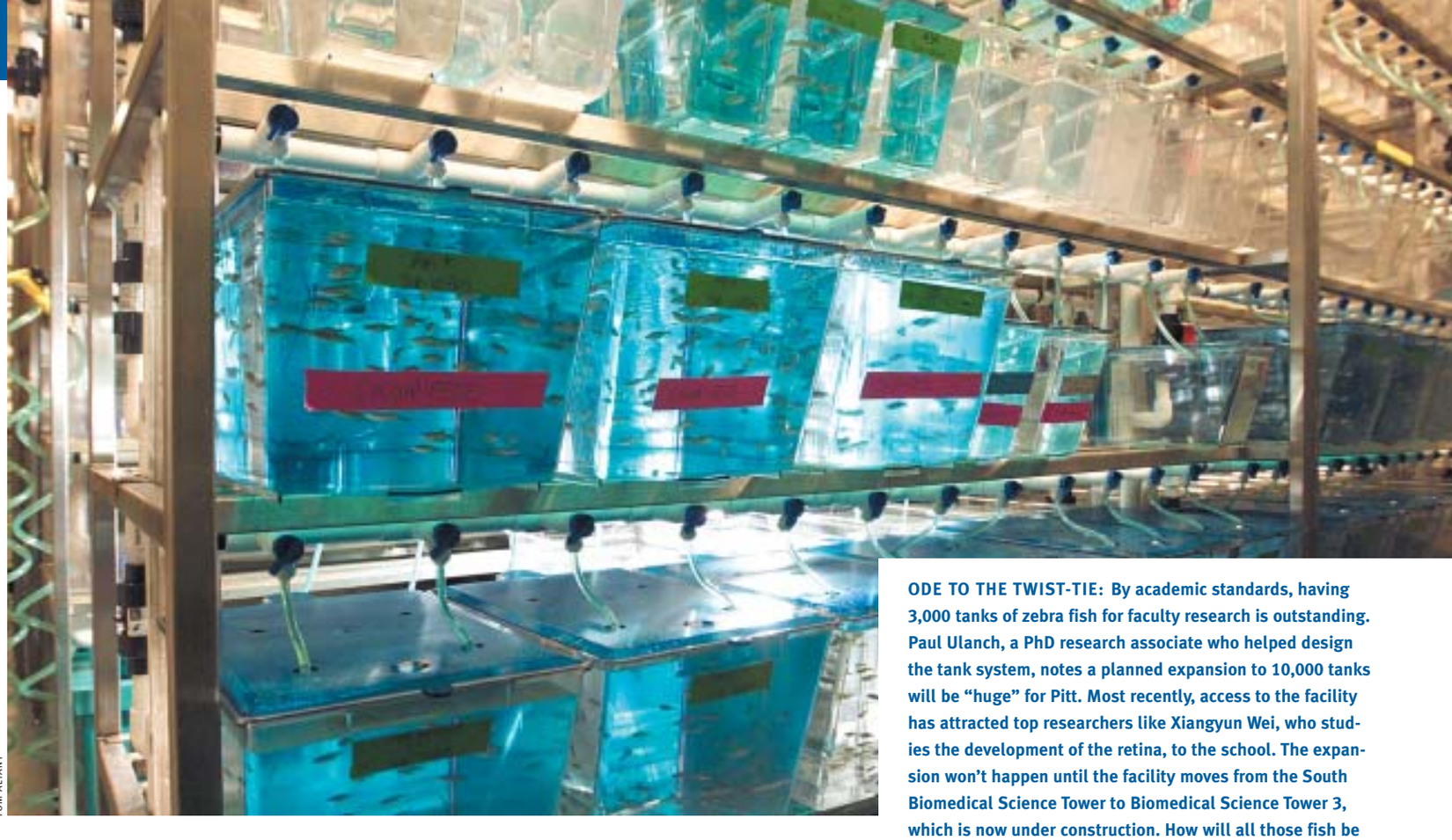
CAMI MESA

Vanesa Rawe

Americas Fellow Looks at Infertility

As a scientist working in her native Argentina, Vanesa Rawe would order antibodies needed for experiments from U.S. companies. It would take two to three weeks for the antibodies to arrive, and they would cost double the catalog price owing to shipping charges and import taxes. As a postdoc at Pitt, Rawe can now get the antibodies in two days (plus she works with better equipment). In 2003, the National Institute of Child Health and Human Development awarded Rawe an Americas Fellowship—an honor given each year to a handful of Latin American PhDs doing reproductive research. The fellowship provides funding for up to two years of advanced training in the United States. Rawe is working in the lab of Gerald Schatten, professor and director of the Pittsburgh Development Center—where she attempts to better understand, at the cellular and molecular levels, normal fertilization and problems that lead to infertility.

"Her long-term, demonstrated commitment to basic-science inquiry of increasing complexity, as well as her technical prowess at assisted reproductive technologies and microscopy, won her this well-deserved award," says Schatten. Rawe plans to return to Argentina in 2005. *—DH*



TOM ALTANY

ODE TO THE TWIST-TIE: By academic standards, having 3,000 tanks of zebra fish for faculty research is outstanding. Paul Ulanch, a PhD research associate who helped design the tank system, notes a planned expansion to 10,000 tanks will be "huge" for Pitt. Most recently, access to the facility has attracted top researchers like Xiangyun Wei, who studies the development of the retina, to the school. The expansion won't happen until the facility moves from the South Biomedical Science Tower to Biomedical Science Tower 3, which is now under construction. How will all those fish be moved? Ulanch isn't 100 percent sure: "Baggies?"

Hillier

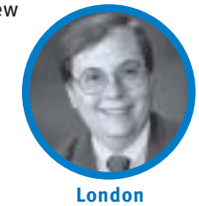
Appointments

Sharon Hillier was recently elected president of the Infectious Diseases Society for Obstetricians and Gynecologists. She is the first woman and the first non-MD to head the organization, which is an arm of the American College of Obstetrics and Gynecology. Hillier is a PhD and a professor of obstetrics, gynecology, and reproductive sciences and of molecular genetics and biochemistry in the School of Medicine. She has found that a common vaginal condition called bacterial vaginosis (BV) puts women at increased risk for getting genital herpes. BV, which is believed to affect one in seven women, is characterized by a change in the pH and bacterial population in the vagina; the disease can be asymptomatic or can result in a vaginal discharge or odor. Hillier hopes her findings will lead to more aggressive treatment for BV—currently, the disease is generally not treated if it is asymptomatic. "Even common vaginal conditions, like BV, that people have thought of more as a nuisance rather than a real medical problem, may play a real role in enhancing the spread of herpes," says Hillier, noting that the disease is becoming more widespread: "We've seen a doubling in genital herpes in the past decade, even though, supposedly, it's the era of safe sex."

65,000 SCIENTISTS STRONG

Not every scientist takes a stand on Capitol Hill—but Robert Wells does. Wells is director of the Center for Genome Research at Texas A&M University, Houston, and a 1964 PhD graduate of the School of Medicine. As president of the Federation of American Societies for Experimental Biology (FASEB), he urges Congress to increase funding for the National Institutes of Health, the National Science Foundation, and other federal agencies that support scientific research. Such lobbying is part of FASEB's mission; the group is a consortium of 22 scientific societies, including the American Society for Clinical Investigation and the American Physiological Society, and represents 65,000 scientists. As FASEB president, Wells is involved in responding to inquiries from members of Congress and their staffs about a variety of scientific issues, including the use of stem cells and animals in research. One of Wells' goals is to build ties between FASEB and the American Mathematical Society, the American Physical Society, and the American Chemical Society—alliances that will strengthen the lobby for increased funding. "Excellent progress in biomedical sciences depends on excellence in the underpinning sciences, such as mathematics, computer science, chemistry, even physics," says Wells. ***—DH***

A mouse's heart beats 10 times faster than a human's—650 times a minute. And mice are helping researchers understand human arrhythmias—irregularities in the rhythm of the heartbeat. **Barry London**, the new chief of the Division of Cardiology, uses mouse models to identify genes that control the electrical activity of the heart. He also studies human families with a rare form of inherited arrhythmia—he hopes to identify the genes responsible for their disease. His research could help doctors identify which patients with arrhythmia are most at risk for sudden death—and thus which patients are the best candidates for treatment with an implanted defibrillator. In his new role as division chief, London, an MD and PhD, plans to recruit more basic science faculty, particularly those who study blood vessels and what leads to their becoming blocked. *—DH*



London

ONE STEP CLOSER

A NIGHT IN THE ER
BY JOSIE FISHER

CAMI MESA

Jonathan Landry is one of many students who "try on" emergency medicine.

Before the evening shift in the emergency department at UPMC Presbyterian, Jonathan Landry (Class of '06) hunts down the free soda machine in the EMT room. He inhales a cup of syrupy Pepsi before finding Susan Dunmire (MD '85), associate professor of emergency medicine. She briefs him on the patient triage chart—color-coded squares on a computer monitor: "The back 15 rooms are yellow, for critical, and trauma is red."

Landry jumped at this opportunity, facilitated by the University of Pittsburgh's Emergency Medicine Student Association, to shadow a physician in the ED. The student thinks he wants to go into emergency medicine but hasn't ruled out other possibilities. "I need to see if this is what I want to do," he says.

He follows Dunmire into the room of a patient with metabolic acidosis—the man's blood pH level is low. When they walk out of the exam room, Dunmire quizzes him: "Do you remember your MUDPILES?" MUDPILES is a mnemonic for factors that can cause one type of acidosis. Landry begins: "M for methanol, U for uremia …."

"Very good," says Dunmire, "Get his blood pressure and ask again about alcohol and meds."

Landry returns to the patient's room. The patient twitches nervously as Landry applies a blood pressure cuff and questions him. Later, Landry reports his findings to Dunmire, noting that the patient seemed defensive in his vehement denials of any drinking. His symptoms—pain, difficulty eating, and a couple of unusual lab results—don't add up to anything concrete. Dunmire decides to send him for further testing and to admit him to the hospital.

For Landry, it is a lesson in the nature of emergency medicine. In the short time frame of the ED, doctors may not always get to the bottom of patients' conditions. There's not always a sense of closure.

Landry heads over to the trauma bay as a car accident victim arrives. He joins a bevy of others looking on as the trauma team and ED staff treat the victim. It's frustrating not to be involved with the case, admits Landry. He wishes he was at a level of training that would enable him to help the team resuscitating the patient.

Despite the minor frustration, the night reinforces Landry's interest in emergency medicine. He likes the variety of cases he sees—a patient whose pacemaker is in overdrive, a man with dementia, a woman being evaluated for involuntary psychiatric commitment. He feels the intensity of the ED is more suited to his personality than a "drier" environment. He has shadowed before in non-ED settings, but those experiences didn't make him feel "as alive."

Shadowing will help him make some decisions about his future. Even with clinical rotations, med students are not exposed to every single specialty and subspecialty. Shadowing enables students to fill in the gaps and experience areas of special interest. And Pitt is a great place for such exploration, notes Landry:

"Physicians who come in to do PBLs [problem-based learning sessions] love to invite us to go on rounds with them." The opportunities to shadow physicians are, Landry says, "limitless." ■

Some details in this story have been changed to protect patient privacy.

PRACTICE, PRACTICE, PRACTICE

More than a dozen medical students gather around tables piled with catheters, tourniquets, and tubing at this workshop sponsored by the Emergency Medicine Student Association (EMSA). A nurse demonstrates how to insert an IV. As blood appears, several students look away or cover their mouths; one sheepishly admits she feels woozy. The nurse removes the needle with ease. They have questions: "When you pulled that out, how did you make sure blood didn't spray everywhere?"

"It's a vein. It wouldn't do that," she replies.

Second-year medical student Adam Tobias seems nervous as he looks over his classmate's arm, preparing him for the procedure. "Look how hairy your arm is," he exclaims, rolling up the sleeve. Tobias applies the tourniquet over the sleeve. (The nurse has told the group this avoids causing pain to hairy arms.)

Tobias is a cocoordinator of EMSA. Through the group, he has seen x rays of fractures and bullet wounds and learned about common overdoses. He has heard a case history of a meningitis patient and has practiced drawing blood and suturing pig's feet. The workshops give him practical advice and opportunities he's not likely to get from a textbook or lecture. Another advantage: As you give up your arm to your classmate's needle, he says, you experience the patient's point of view. A moment of reckoning.

Tobias hesitantly taps the inside of his classmate's arm, looking for a vein. —*CB*