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A Futuristic Fin

Recently, Stephen Badylak, research professor of surgery, got a phone call about a dolphin named Liko.

“Even though I’m a veterinarian, I don’t know that much about dolphins, in fact next to zero, except that I used to watch *Flipper*,” he says.

The dolphin’s life was in danger because it had repeatedly injured its dorsal fin. Another injury and Liko was likely to lose the fin, which is essential for temperature regulation and steering. The veterinarian who called Badylak knew that the Pitt professor had developed a “bioscaffold” used in some 250,000 human patients to repair small bits of tissue.

(Once placed in a person, the scaffold, which is made of

animal products, degrades, summoning cells and other factors to rebuild the damaged human tissue.) The vet wondered: Was there a tissue engineering solution for Liko? Badylak thought he could make one work.

Using pig bladder, Badylak made

a scaffold to fill in the hole in the fin; the scaffold was approximately 8 by 4 inches.

“It’s probably the biggest piece of tissue that we’ve ever tried to regenerate,” says Badylak, an MD/PhD, as well as a DVM. A few months after the scaffold was implanted, Liko had regrown about 90 percent of the missing piece of fin and was no longer in danger of losing it. For Badylak, the success went beyond saving the dolphin: “Now we know we can grow a blood supply into an area that’s very big. We know that we can grow nerves into it. That’s pretty significant, because it says it’s possible to [accomplish this] in a mammal. ... The real application is to extend this finding to human patients who need a new heart or a new esophagus.” —Dottie Horn



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FOOTNOTE

Ask Pittsburghers when they became Steelers fans, and they probably won’t understand the question. People are born that way, right? That was true this winter at Magee-Womens Hospital, where newborns donned the black and gold right out of the womb. A 74-year-old fan crocheted tiny gold hats with black and gold tassels for babies born on Steelers’ playoff game days. Alas, she’d planned to have enough for the Super Bowl, too.



Faculty Snapshots

One secret of outstanding mentoring, from an expert: “You have to make it clear to people that your mentorship extends beyond the straightforward part of their professional and academic life, that you’re there to help them with other issues that might come up. ... People don’t live in a vacuum. They’ve got families and children and responsibilities outside their home,” says **James Roberts**, professor of obstetrics, gynecology, and reproductive sciences. He recently received an award for mentoring, the Duane Alexander Award for Academic Leadership in Perinatal Medicine (given by the National Institute of Child Health and Human Development). A leading researcher on preeclampsia and a member of the Institute of Medicine, Roberts has mentored close to 50 MDs and PhDs, most of whom are still academics.



Roberts

Coronary artery bypasses might be more effective if stem cells were transplanted into the heart at the time of the bypass, according to pilot data from **Amit Patel**, director of clinical cardiac cellular therapies, McGowan Institute for Regenerative Medicine, and **Robert Kormos**, professor of surgery. The researchers recently conducted a randomized trial in South America with 20 patients—half received the bypass alone, half received the bypass as well as a transplant of approximately 20 million stem cells. (The cells were from the patients’ bone marrow.) Patients who received the stem cells and a bypass experienced better heart function and fewer symptoms of heart failure than those who received the bypass alone. In another study, the researchers used a stem cell transplant as a treatment for 10 patients with idiopathic heart failure (the reason for their heart failure is unknown, but it is unrelated to coronary artery disease—a bypass won’t help these patients). The transplants improved heart function. This year, the researchers anticipate getting FDA approval to repeat these studies in the United States.

Two million people die each year from tuberculosis, the second leading cause of death from infectious disease worldwide. **Joanne Flynn**, an associate professor of molecular genetics and biochemistry and TB researcher, recently received a Senior Scholar Award from the Ellison Medical Foundation. The award will enable her to use a monkey model of TB to explore why some monkeys get active TB and others contain the infection and have latent TB. (Ninety percent of infected people develop the latent form of the disease.) She will try to find markers in blood that could predict whether someone, once infected, will develop active or latent TB, and whether a person with latent TB will end up with the active form of the disease. —DH



Flynn

A&Q

On the Peace Corps/Pitt Med Connection

In 2000, first-year student Peter Syré (above, right) and his wife arrived at Pokigron, a village of about 200 people in Suriname. As Peace Corps volunteers, their task for the first few months was to visit with people in the village. They’d sit in a family’s home for an hour or two; they’d go back to visit again and again. The couple wanted to get to know people, to gradually learn about what the community needed, to build trust. Only later would they implement projects, including educating villagers about health issues, especially malaria and AIDS; teaching small children; and creating a 300-book library for children in the school. Giving children access to books beyond school hours was “a pretty huge thing,” says Syré. His classmate, Jessica Robb (above, left) spent two years as a Peace Corps volunteer in Guinea, West Africa, where she implemented several health education projects in a village of 1,000. Two other members of the Class of ’08 (not pictured here), Brandi Swanier and Andrew Fisher, are also former Peace Corps workers. What’s the connection between the corps and medical school? For Syré, working in a village clinic made him first consider a career as a physician; seeing babies born and helping to vaccinate children intensified Robb’s interest in medicine.

On the challenges of the Peace Corps experience:

Robb: I was put in a place with no support network. I didn’t have the language skills I needed. I saw all this poverty and people suffering. And the customs were different. Before any conversation, you go through a five-minute string of greetings that includes asking about the person’s family—whether or not you’ve ever met them. There were many difficult aspects. But now I think, “If I could deal with that experience, I can deal with most things that will come my way.”

Syré: Two years seems like an enormous amount of time in your life, because you could be doing something else. But it’s such a small, small amount of time. You’re leaving, and you’re still just figuring out what’s really going on at the place where you live. You’re just skimming the surface of the whole culture, the whole dynamic in your village.

On the impact they had:

Robb: Personal interactions and relationships may have had the biggest impact, just working with a little neighbor girl and helping her with her homework to promote education for women, since two-thirds of women in the country had never even been in a school.

Their question for us:

For others who’ve had this type of experience, did they ever do it again?

—Interview by Dottie Horn

WE’D LOVE TO HEAR YOUR RESPONSE: medmag@pitt.edu

SIMMONS GETS MEDAWAR PRIZE

Forty years ago, in the early days of organ transplantation, when immunosuppression was first used, organ recipients began developing infections. These infections previously had been very rare, so they were largely unrecognized by surgeons, their clinical presentation and course were uncertain, their cause was unknown, and treatments didn't exist. One infection, which was often fatal, later turned out to be caused by cytomegalovirus. "What I did with colleagues was to describe this illness, so that you could recognize it from across the room," says Richard Simmons, Distinguished Service Professor of Surgery and emeritus chair of that department. Simmons also uncovered the clinical pattern of a condition in transplant recipients caused by the

Epstein-Barr virus. Before that, no one knew that the Epstein-Barr virus could turn into a cancer-causing agent under immunosuppression.

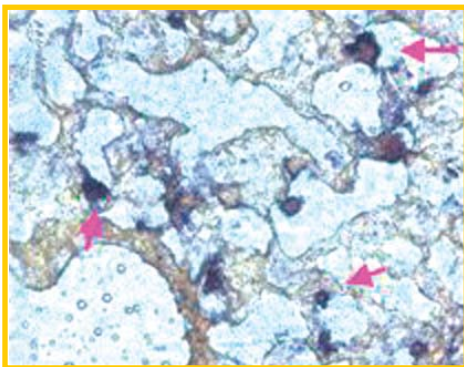
For these discoveries, Simmons was recently awarded the Transplantation Society's Medawar Prize, which he shared with his mentors, John Najarian and Paul Russell (of the University of Minnesota and Massachusetts General Hospital, respectively). The prize is the world's highest honor for contributions to the field of transplantation. —DH



A PROTECTIVE MIST

Esophageal cancer has a grim prognosis—less than 25 percent of people diagnosed survive five years. In some cases, doctors cannot treat the patient with enough radiation to eradicate the cancer, because the treatment would destroy the lungs. Matthew Carpenter, a radiation oncology resident, and Joel Greenberger, professor and chair of radiation oncology, have developed a gene therapy that might one day be used to protect lungs during radiation. Under normal circumstances, the cells' small reserves of antioxidants (some from food or vitamins and some produced internally) are no match for the large numbers of destructive free radicals that form in irradiated tissue. But the new Pitt therapy delivers a gene that boosts cellular production of an internally produced antioxidant called MnSOD. There's good news: The treatment works in animals. The researchers have shown that injecting the gene therapy into the windpipes of mice before irradiating them prevents some lung damage. However, using a windpipe injection in humans would be painful and could lead to infection. So the researchers took another approach. Carpenter recently showed that the mice can also derive lung protection by inhaling a mist containing the gene. For the aerosol research, the American Society of Therapeutic Radiation and Oncology awarded him the Resident Clinical/Basic Research Award in biology.

The researchers are now awaiting approval from the FDA to begin human testing of the MnSOD therapy. —Corey Ballantyne



COURTESY EMERY

After gene therapy, these lung cells are producing more of an antioxidant (dark blue), which helps protect against radiation.



Film Treatments

As a med student, Jim Basinski (Class of '05) has interviewed more than 40 patients with schizophrenia. One said that while she was sitting in a restaurant, everyone was staring at her because her food was poisoned. Another heard the voice of Satan telling him to kill himself. The first few times patients described their delusions to him, Basinski was shocked. Soon, however, hearing about psychotic visions became routine, business as usual. Basinski wonders how often doctors imagine what it is like to experience what are often terrifying hallucinations. (Medication can help a patient's visions subside.) Basinski is interested in how doctors keep from becoming "emotionally and intellectually numb" to patients.

One recent Friday night, he watched *Donnie Darko—The Director's Cut*, as part of the Film Interest Link for Medical Students (FILMS), a group formed for medical students interested in meeting periodically to watch and discuss movies. Some of the movies are related to medicine and some aren't; regardless, the conversation about the film usually turns in that direction: "Medicine is everywhere, once you look for it," says Alana Iglewicz (Class of '05), the group's founder.

Darko tells the story of Donnie (Jake Gyllenhaal), a teenage boy who sees and takes orders from a 6-foot-tall talking rabbit demon. The boy shows the classic symptoms of someone with paranoid schizophrenia, and *Darko* viewers see Donnie's demon as he does. Since watching the movie, Basinski, an aspiring psychiatrist who especially likes fantasy and science fiction films, sometimes finds himself making up a movie in his head about the delusions a patient has described. Watching the movie made him think that you could make a film out of every life—and reminded him to view each patient not just as a collection of symptoms or a diagnosis, but as the subject of his or her own personal story.

"Movies remind us of the drama, emotions, and mysteries of life that are happening all around us, but sometimes we're not sensitive [enough] to see," he says. —CB



C.E. MITCHELL

THE SMILE ZONE

The glimpse of a stuffed menagerie sometimes entices strangers—visitors to the med school or lost patients—into the Scaife Hall office of Robin Hammonds and Judy Schantz, who are both curriculum specialists. In just three years, Hammonds and Schantz have collected more than 150 Beanie Babies, mostly bears, but also the odd crab, pelican, monkey, and snail. When frazzled med students come to the office—looking, say, for help with lost keys, emergency messages from family, or replacements for lecture notes—they often smile or laugh at the extensive array of animals. “They help you to not take yourself and life so seriously,” says Schantz. “If you look around, how can you stay upset?” Even so, the collection isn’t the office’s main attraction. “We have a candy jar that draws more people than the Beanies,” adds Schantz. —CB

Appointments

W. Allen Hogge is the new chair of the Department of Obstetrics, Gynecology, and Reproductive Sciences. The field of obstetrics and gynecology is most often associated with pregnancy and menopause, but it’s also concerned with diseases, like gynecologic cancers, many of which occur in postmenopausal women. In light of the aging population and Pitt’s strengths, Hogge will expand the department’s Division of Gynecologic Oncology. He also will develop an entirely new focus in the department, creating a prenatal medicine program, which will study ways to treat fetal problems prior to birth using medical rather than surgical approaches. Hogge, an MD who has been at Pitt since 1992, plans to recruit approximately 10 faculty members in the next three years. His own research has focused, in part, on evaluating an early, noninvasive method of prenatal testing for birth defects.



Hogge

In a paper published in *Nature Neuroscience* in 2000, **J. Timothy Greenamyre** showed that when rats receive chronic, low-level exposure to the pesticide rotenone, they develop the features of Parkinson’s disease. The paper offers strong evidence that environmental factors can cause the disease. “Although rotenone is not a



Greenamyre

widespread pesticide, there are many other much more commonly used pesticides that have the same mechanism of action as rotenone,” says Greenamyre. “If we look at cells in a dish, some of [these other pesticides] are much more toxic than rotenone.” Greenamyre is investigating the effects of these other pesticides in animals; he also recently showed that exposure to rotenone causes monkeys to develop features of Parkinson’s. Greenamyre, an MD/PhD, came to Pitt in November from Emory University; he will direct the Pittsburgh Institute for Neurodegenerative Diseases and the movement disorders division within the Department of Neurology.

Ivet Bahar, until recently a professor in the School of Medicine’s Department of Molecular Genetics and Biochemistry, is the chair of the school’s new Department of Computational Biology. Pitt is one of the first medical schools in the country to establish a computational biology department—giving the new discipline the same status as more traditional fields. —DH

“YOU SAVED ME”

A DOMESTIC VIOLENCE
CRUSADE

BY DOTTIE HORN

Sandra Mills’ boyfriend was threatening her. He had a gun at home. She and her two children had escaped, to a friend’s house, but she couldn’t stay there. She called the domestic violence crisis hotline. Padi McFadden (Class of ’05) answered the phone.

McFadden listened to Mills (not her real name) and gradually began to assess the situation: Was the woman in immediate danger? What was her greatest need? Was she an appropriate candidate for the women’s shelter? McFadden helped Mills develop a plan for how she could stay safe until she came to the shelter.

“It’s always horrible to hear about situations, but it’s really rewarding to be on the phone with somebody and to help them. I just fell in love with the hotline,” says McFadden, who has volunteered at the hotline since her first year of medical school. “Domestic violence has made itself my little crusade.”

FOOTNOTE

“There have been some medical schools in which, somewhere along the assembly line, a faculty member has informed the students, not so much by what he said but by what he did, that there is an intimate relation between curing and caring.”

—Ashley Montagu

American scientist, 1905–1999



McFadden’s work on behalf of abused women has permeated her medical life.

In March 2003, McFadden became a leader in the American Medical Student Association’s domestic violence advocacy project, a yearlong initiative. For that project, she put together brief guidelines on domestic violence screening that med students could download onto their Palm Pilots and take into the clinic. “The thing I always thought, especially in the beginning, was, *What do I say? I need words.* I wanted to give people words to say,” she recalls.

As part of a women’s health area of concentration project, she’s now working to put volunteer domestic violence advocates into the emergency departments of local hospitals.

But the core of her advocacy has been the hotline—the one-on-one interaction with women in crisis.

She’s learned not to tell those women, *I think you should do this.* “That was a really difficult thing for me to learn,” she says.

Her well-honed listening skills and the hotline’s philosophy of empowering women to make choices for themselves will prove invaluable, she believes, when she interacts with her own patients and helps them make behavioral changes.

But the work can sometimes be overwhelming. She remembers the man who beat his quadriplegic wife. He’d threatened to kill the woman and her adult daughter if she left. She remembers crying after she got off the phone with a woman whose boyfriend had repeatedly raped her 8-year-old daughter. “My heart went out to her,” says McFadden.

Some days, she wonders if there’s any good left in this world. “And then,” she says, “it’s very hard to not be suspicious of everyone’s relationship around you.”

Even so, the chance to bring about change makes her involvement worthwhile, McFadden believes: “I have a view of the world that some people do bad things, but it’s the result of bad experiences they were brought up in or exposed to.

“Maybe it’s idealistic, but if we can change circumstances, we can make the world better.”

Sometimes the impact of her work is tangible. A few days after she spoke to Mills on the hotline, McFadden was at the shelter. That night, Mills and her children arrived to move in. “She just had this incredibly big, warm smile on her face and was so happy to meet me,” says McFadden. “She said, ‘You saved me.’”

“I didn’t save her, but that’s what she said. That was so rewarding.” ■