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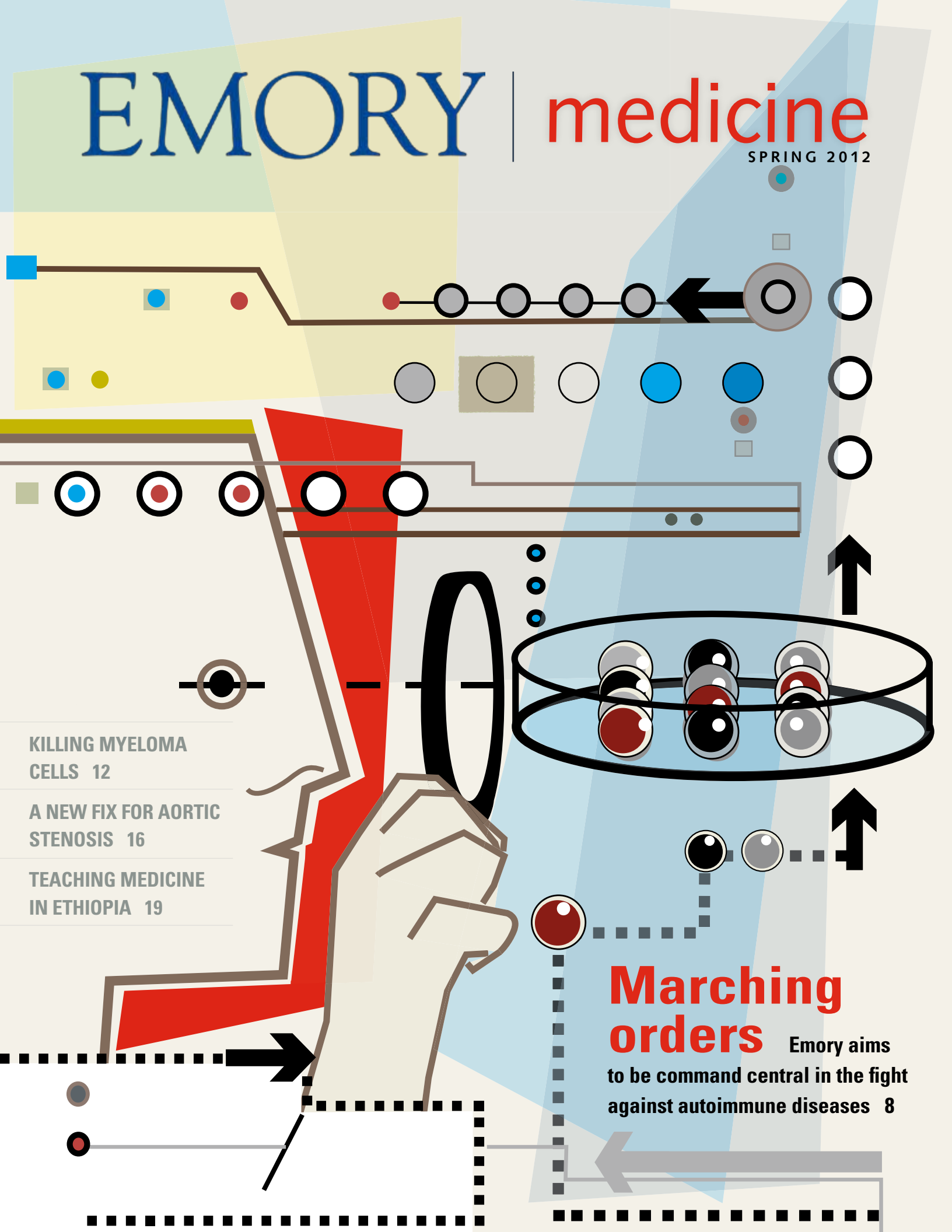

Marching orders

Emory aims to be command central in the fight against autoimmune diseases 8

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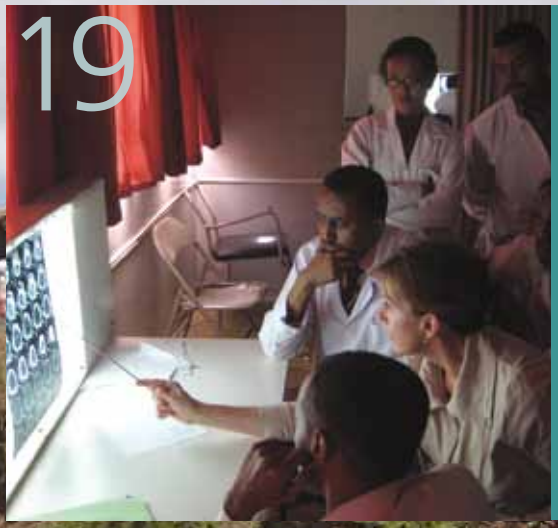

BEYOND BORDERS

Radiologist Patricia Hudgins looks over a patient's scan with her Ethiopian colleagues. Hudgins and other Emory medical faculty are developing programs to improve health care in Ethiopia. Read more on page 19.

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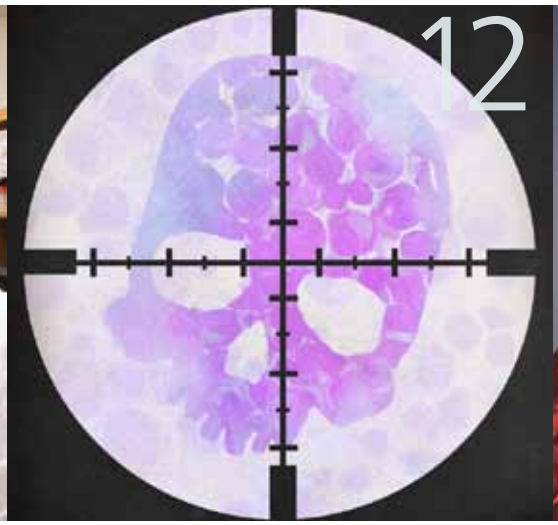

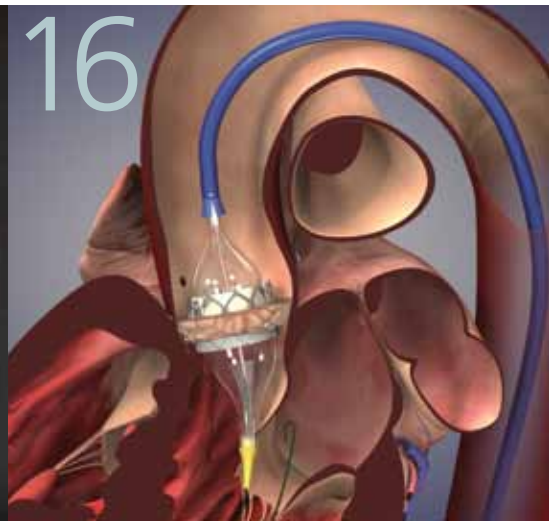

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At left: Ethiopians make their way to church on a religious holiday. Photo by Patricia Hudgins.

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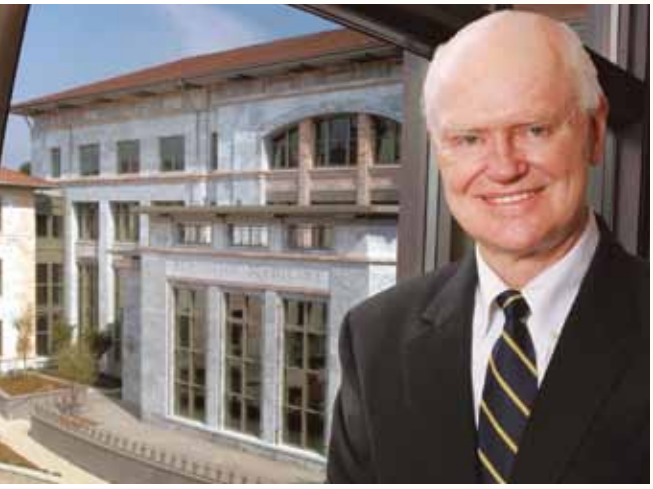
Dean's Message

Winds of change

The School of Medicine has a wonderful and vast pool of alumni and getting to know many of you over the years has been a great pleasure, so it is bittersweet for me to tell you that I am stepping down as dean effective Aug. 31. I plan to take a year's sabbatical before returning to the faculty to continue my research and clinical practice. The past 15 years have been exciting, challenging, even trying at times, but always deeply satisfying.



Editor's note: Dean Lawley is the fourth longest serving dean among U.S. medical schools. He became dean in 1996 after joining the dermatology faculty in 1988.

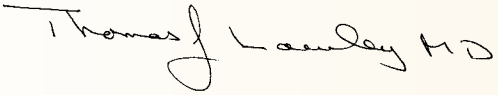
We have accomplished much together. Since 1996 the medical school increased its NIH-sponsored research funding nearly five-fold to more than $265 million per year. In fact, we rank 15th in the country in NIH funding. The size of our faculty has nearly doubled. We built one of the finest medical education buildings in the country and transformed our curriculum to meet the changing demands of medicine.

You, the alumni, have supported our faculty and students throughout the years. Your financial support and work behind the scenes have helped carry our school from a regional presence to a national player.

And your continued support is needed. Our work is not done. There is much clinical and basic science research needed to transform patient's lives, to rid the world of deadly diseases and debilitating conditions.

Although our medical school will continue to grow and transform as medicine does long after I step down, one thing will remain constant. The education of the next generation of doctors will always be our top mission. We attract smart, well-rounded applicants to fill the next class. We demand a lot from our students, and they demand a lot from each other. And they deliver. We graduate doctors who not only provide their patients with technical expertise but also communicate with their patients effectively and compassionately.

When I look back on my career, serving as dean has been my greatest accomplishment, but to say that I had a hand in educating many of the young doctors that you now call your colleagues is my greatest reward.



Thomas J. Lawley
Dean

In Brief

Pipeline embolization device repairs **formerly untreatable aneurysms**

Patients with a brain aneurysm deemed untreatable now have a therapy option in the pipeline embolization device (PED). Jacques Dion, director of the interventional neuroradiology division, is among the first physicians in the United States and the first in Georgia to use a PED to treat large or giant wide-necked aneurysms.

PED is for adults aged 22 years or older with large wide-necked intracranial aneurysms in the internal carotid artery. The metal device, ranging in size from 10 to 35 mm, is placed across the neck with the help of a catheter. The procedure redirects blood flow away from the aneurysm, causing the blood that remains in the aneurysm to form a clot that serves to prevent the aneurysm from rupturing.

Other existing techniques for treating wide-neck aneurysms are often invasive, leading to longer hospital stays and greater risk for complications, and they are thus inapplicable in patients who are medically fragile.

"The pipeline device may offer improved patient results with a safer and more effective treatment of large or giant wide-necked aneurysms, which until now has been an unmet clinical need," says Dion. "We now have a surgical tool for those patients who have had no other options for treating this often debilitating and even fatal medical condition."

Despite flat budgets at the National Institutes of Health and at not-for-profit organizations, the medical school **increased its research funding** in 2011. The school received $348.4 million, up from $347.7 million in 2010.

Protein may be key to explanation for **racial disparities in kidney failure**

African Americans are more likely to excrete protein in their urine than Caucasians, a finding that may contribute to their much higher incidence of kidney failure, according to Emory researchers.

"Treating urinary protein excretion may help reduce racial disparities related to kidney failure as well as reduce the rate of progression of kidney failure for everyone," says William McClellan, an Emory nephrologist who led the study.

Reasons why African Americans excrete more protein may be related to hypertension, obesity, smoking, vitamin D levels, and genetic differences, McClellan says.

The incidence of kidney failure in African Americans is nearly four times greater than in Caucasians.

In Brief

Enzyme that flips switch on cells' sugar cravings may be **anti-cancer target**

Cancer cells tend to take up more glucose than healthy cells. Their sugar cravings arise partly because they turn off their mitochondria—power sources that burn glucose efficiently—in favor of a less efficient glucose-burning mode. They benefit because the by-products can be used as building blocks for fast-growing cells.

Scientists at Emory's Winship Cancer Institute have found that many types of cancer cells flip a switch that diverts glucose away from mitochondria. Their findings, published in *Molecular Cell* in December, suggest that tyrosine kinases—enzymes that drive the growth of several types of cancer—play a greater role in mitochondria than previously recognized.

The scientists found that several oncogenic tyrosine kinases activate PDHK, an enzyme that has a gatekeeper function for mitochondria, and that many of these tyrosine kinases are found within mitochondria.

Introducing a form of PDHK that is insensitive to tyrosine kinases into human cancer cells forces the cells to grow more slowly and form smaller tumors in mice, says Jing Chen, a hematology and medical oncology researcher at Winship. This finding indicates that PDHK could be a target for drugs that specifically target cancer cells' altered metabolism. "PDHK is a very attractive target for anticancer therapy because of its role in regulating cancer metabolism," he says.

The experimental drug dichloroacetate, which inactivates PDHK, is in clinical trials for cancer. Chen is collaborating with Haian Fu, director of the Emory Chemical Biology Discovery Center, to find other, more potent inhibitors of PDHK.

A **coronary calcium scan** proved to have the highest cost-benefit ratio in identifying cardiac risk, compared with other screening measures (inflammation, carotid artery thickness, and peripheral artery blood pressure), according to Emory cardiology researcher Leslee Shaw. She analyzed data from 6,000 middle-aged and elderly people across the United States.

Better vaccination through **microneedle patch**

The H1N1 vaccine administered by microneedle patch gives better protection against the virus than a vaccine administered by subcutaneous injection, researchers from Emory and Georgia Tech have found. In the study, two groups of mice were 100% protected six weeks after vaccination. Six months later the mice were challenged with the H1N1 virus, and the injected mice had a 60% decrease in antibody protection and extensive lung inflammation compared with the group vaccinated with the microneedle patch. The patch is a more efficient way to deliver vaccines, researchers say, because the skin contains antigen-presenting cells, including macrophages, Langerhans cells, and dermal dendritic cells, that activate immune-signaling cytokines and chemokines.

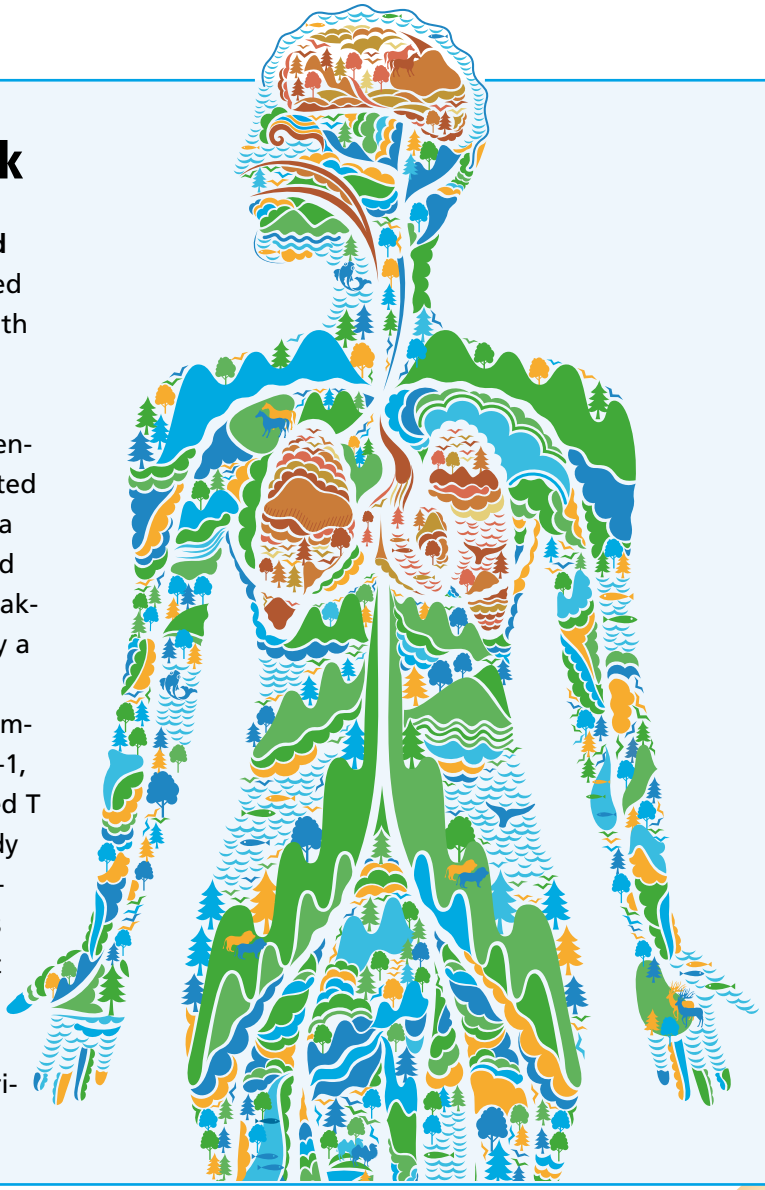
Giving immune cells **a pep talk**

Chronic infections like HIV and hepatitis C take hold because they exhaust the immune system. Exhausted immune cells can be revived though when mixed with fresh cells, researchers at the Emory Vaccine Center have found.

Researchers led by Rafi Ahmed, director of the center, infused CD4 cells ("helper" T cells) in mice infected with lymphocytic choriomeningitis virus (LCMV). As a result, CD8 cells ("killer" T cells), which had mounted an immune response prior to the chronic infection taking hold, were revived, and virus levels decreased by a factor of four after a month.

The cell infusion was especially effective when combined with an antibody that blocks the molecule PD-1, or programmed death 1, which appears on exhausted T cells and inhibits their functioning. The PD-1 antibody helped the T cells revive and enhanced the effectiveness of CD4 cells. In all, the combination of CD4 cells and the PD-1 antibody reduced viral levels by almost ten-fold. The virus was undetectable in some mice.

The helper cells were genetically engineered to recognize LCMV, a difference between mouse experiments and a potential clinical application.

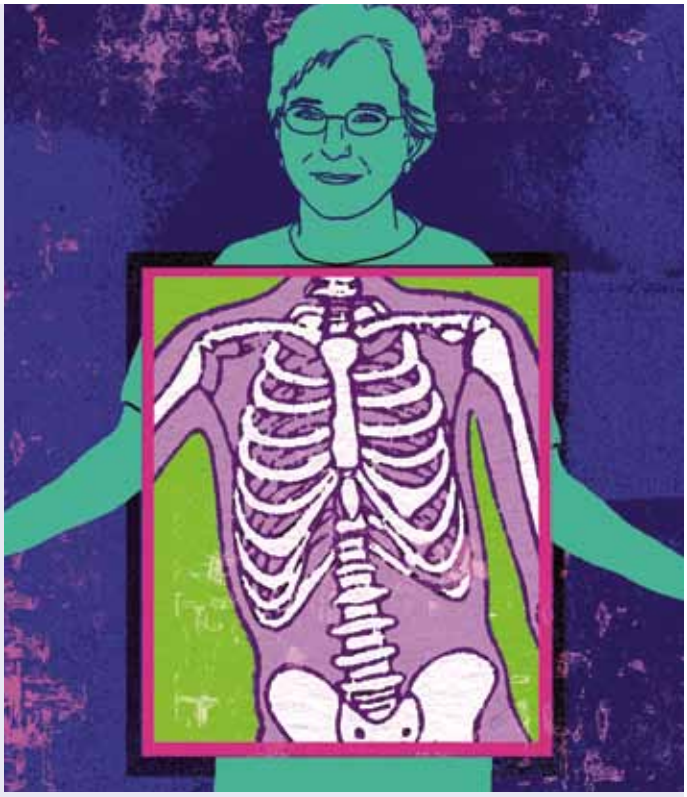


It's official Emory Healthcare and Saint Joseph's Health System successfully closed the terms of their partnership, establishing a joint operating company that combines Saint Joseph's Hospital with Emory Johns Creek Hospital under the Emory Healthcare umbrella. All regulatory approvals were received. Emory Healthcare holds majority ownership of Saint Joseph's Hospital with a 51/49 percentage split, and Saint Joseph's has super majority voting rights on certain issues related to its mission.

New **master's degree program** The medical school has launched a new health professions program in genetic counseling. The two-year program is Georgia's first genetic counseling training program, and its first class begins this summer. "While family history and genetic testing are increasingly becoming an integral part of medical care, there is a national shortage of board-certified genetic counselors who can help both the health care provider and the patient interpret genetic information related to risk," says Stephen Warren, chair of the Department of Human Genetics.

In Brief

Lining up **chemotherapy and radiation**



For patients with non-small cell lung cancer or a rare type of brain tumor, how they receive chemotherapy and radiation therapy may help determine survival time, according to Emory researchers.

More patients who received chemotherapy and radiation therapy concurrently lived longer than those who received the treatment in sequence, two studies found.

Of patients with non-small cell lung cancer who received concurrent treatment, 16% were living after five years compared with 10% of patients who received therapies sequentially, says Walter Curran, the study's principal investigator and executive director of Emory's Winship Cancer Institute.

Curran also served as senior author on a second study comparing survival times of patients with anaplastic oligodendroglioma, a rare brain tumor, containing a genetic abnormality known as 1p19q co-deletion. For this group of patients, the addition of chemotherapy to radiation therapy nearly doubled their median survival time, 14.7 years compared with 7.3 years for those who received radiation alone.

Regardless of treatment assignment, however, patients whose tumors carried the 1p19q co-deletion survived significantly longer than patients whose tumors did not have the co-deletion (more than 7 years versus 2.8 years).

Both studies suggest a new treatment protocol, says Curran, the Lawrence Davis Chair in Radiation Oncology.

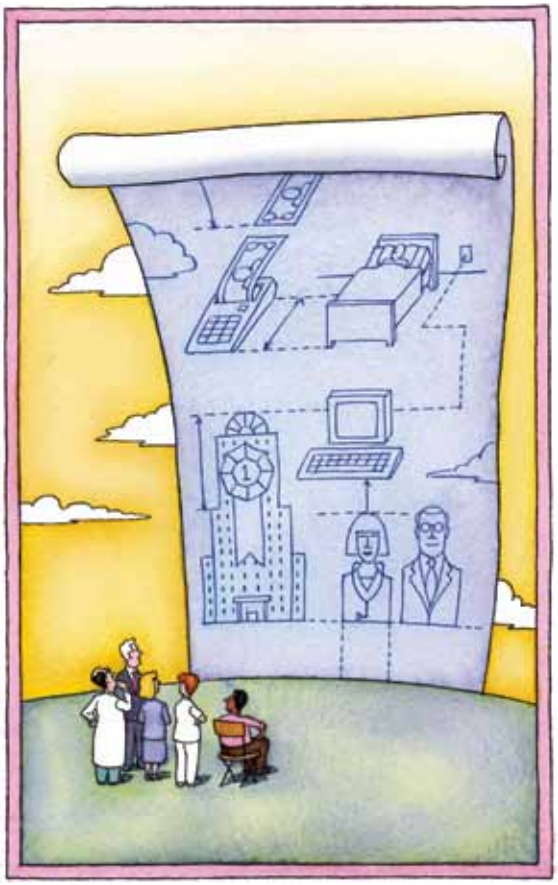
Curran recently was ranked number 22 among 35,000 researchers nationwide in National Institutes of Health funding in 2011. Curran, whose NIH funding totaled more than $16 million, is the only researcher in Georgia and the only NCI-designated cancer center director to be among the top 25 in NIH grant funding.

Want some SOM bling? *Emory Medicine* is conducting a reader survey, and we need your answers to help us produce the best magazine. Answer our ten questions (is that all? yes!) and enter to win a box of School of Medicine goodies—a mug, luggage tag, a picture frame, and more—all emblazoned with the medical school's logo and delivered to your front door. Check out the survey at **http://tinyurl.com/emorymedicinesurvey.**

Remaking **critical care**

When Tim Buchman came to Emory two years ago to streamline critical care within Emory Healthcare, one of his first goals was to make sure every ICU was staffed 24/7 with a nurse practitioner or physician assistant specializing in critical care. In addition, every unit now has a medical director.

These are just some of the changes Buchman has instituted as he remakes critical care within Emory. Since critical care medicine can be the most resource-intensive of all inpatient care, he currently is developing an overall operational plan that details the processes that must take place when a critically ill or injured patient is admitted to an Emory Healthcare ICU. "Not all patients need care at the same level, but they all can be managed by the same processes," he says.



ICU clinicians come from such diverse professional backgrounds as pulmonary medicine and surgical intensive care so he is underwriting interdisciplinary training sessions to improve communication and encourage team building. At one recent session, the team had to work through a hypothetical scenario that included rescuing medical professionals held hostage by foreign rebels. The participants had to develop a plan to get the hostages out of danger and home safely—much as they have to do with many of their patients.

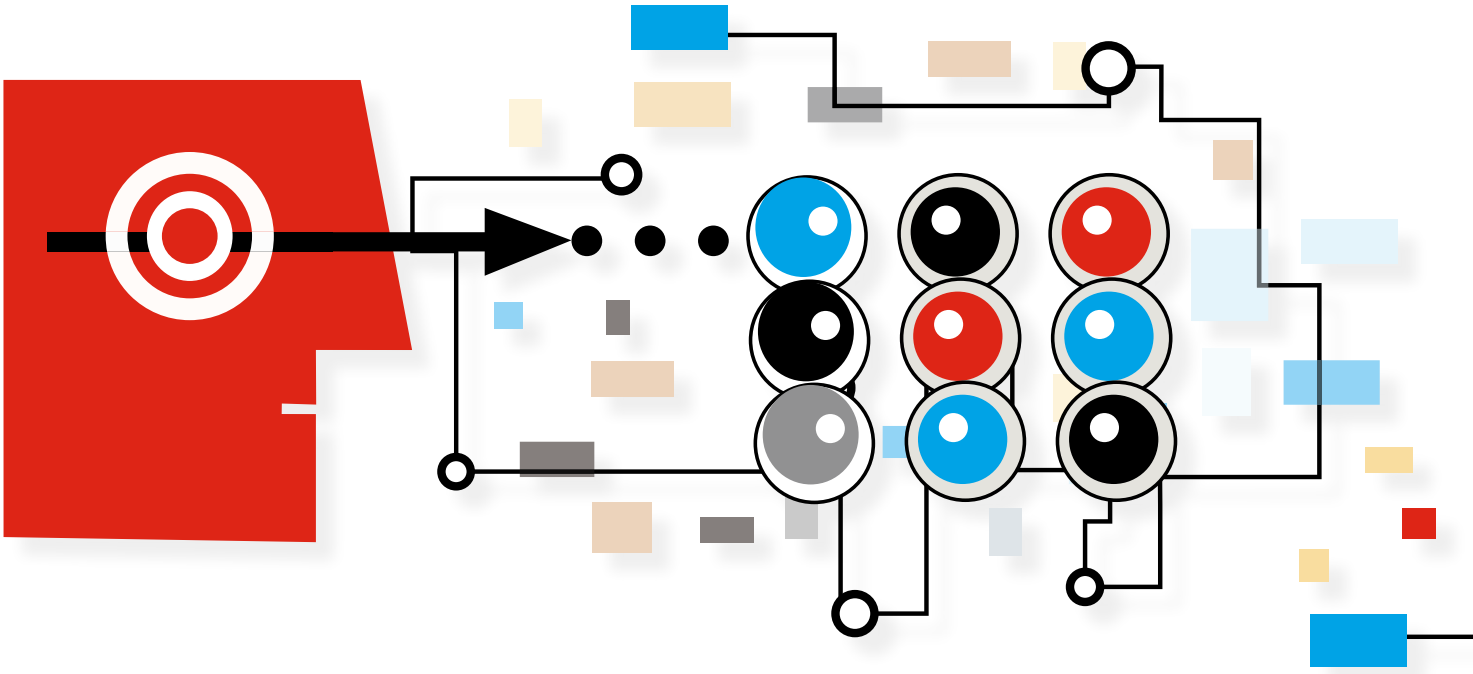
On 11-South at Emory University Hospital Midtown (EUHM), Buchman and his team are building a next-generation ICU that will become the standard design for all Emory Healthcare ICUs. Patient rooms each will be 313 sq. ft., a size that's 83% bigger than current ICU rooms. Each room will have space for family members, including a computer desk.

In the new design, nursing workstations will be located between every two patient rooms, with wide windows into the rooms. Each room will have a camera to send images to a team theater where health care providers will develop a plan to ensure that each patient gets complete and consistent care.

The new ICU also will feature quiet care. "Go into the average ICU today and the first thing you are assaulted by is noise," says Buchman. "Of course it is important to receive and respond to alerts. But why generate the alerts next to the patient? Let's send them directly to the caregiver." The monitoring instruments will send alerts to the workstations or to a "voice badge" that nurses can wear on their lanyards to help them monitor patients as they move about the unit.

These ideas also will be incorporated in Emory University Hospital's new bed tower—more than half of the 210 beds there will be for critical care—and EUHM's new 12-bed cardiothoracic ICU. At Midtown, a bridge will be built to connect the OR and the ICU so postoperative patients can travel from one to the other without having to enter an elevator.

Redesigning critical care now is of particular importance since Atlanta's population is graying. "We're on the cusp of not having enough critical care physicians," says Buchman. In metro Atlanta, the population of people aged 65 and older will rapidly increase by 38% between 2010 and 2015. As a result, demand for these physicians will outstrip supply by as early as this year.



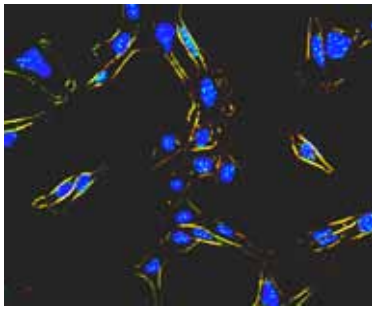
MARCHING ORDERS

Emory aims to be command central in the fight against autoimmune disease

By Dana Goldman • Illustrations by Camille Chisholm

Jacques Galipeau likens what he does to taking a few cells and turning them into an army of combat soldiers—soldiers that he hopes will win the war against Crohn's and other autoimmune diseases.

These "soldiers" are the result of a "cellular bootcamp," a technique Galipeau is perfecting here at Emory that offers patients a chance to use their own cells to fight off the often debilitating symptoms of autoimmune disease. Galipeau, a French Canadian scientist internationally known for putting multiple sclerosis in remission in mice by suppressing their immune system, came to Emory in 2009 with one tactical mission in mind, to set up the Emory Personalized Immunotherapy Center, or EPIC.



Rare mesenchymal cells in blue stain. For every 100,000 cells in a patient's bone marrow, there's one mesenchymal cell.

EPIC is grounded in research by Galipeau and others showing that a particular type of cell in bone marrow called mesenchymal stromal cells can be useful in fighting autoimmune diseases like Crohn's. As Galipeau explains, "The cells nest in your marrow and do a really important job in promoting blood cell development and also in regulating the immune response and participating in wound repair."

EPIC's lab director, Ian Copland, has been working with mesenchymal stromal cells since 2005, when he joined Galipeau's lab in Montreal as a postdoctoral fellow. "This rare population of cells has the ability to modulate the body's immune response," says Copland. "Mesenchymal cells have the unique ability to sense their environment and respond accordingly. If there's no reason for them to be activated, they don't do anything."

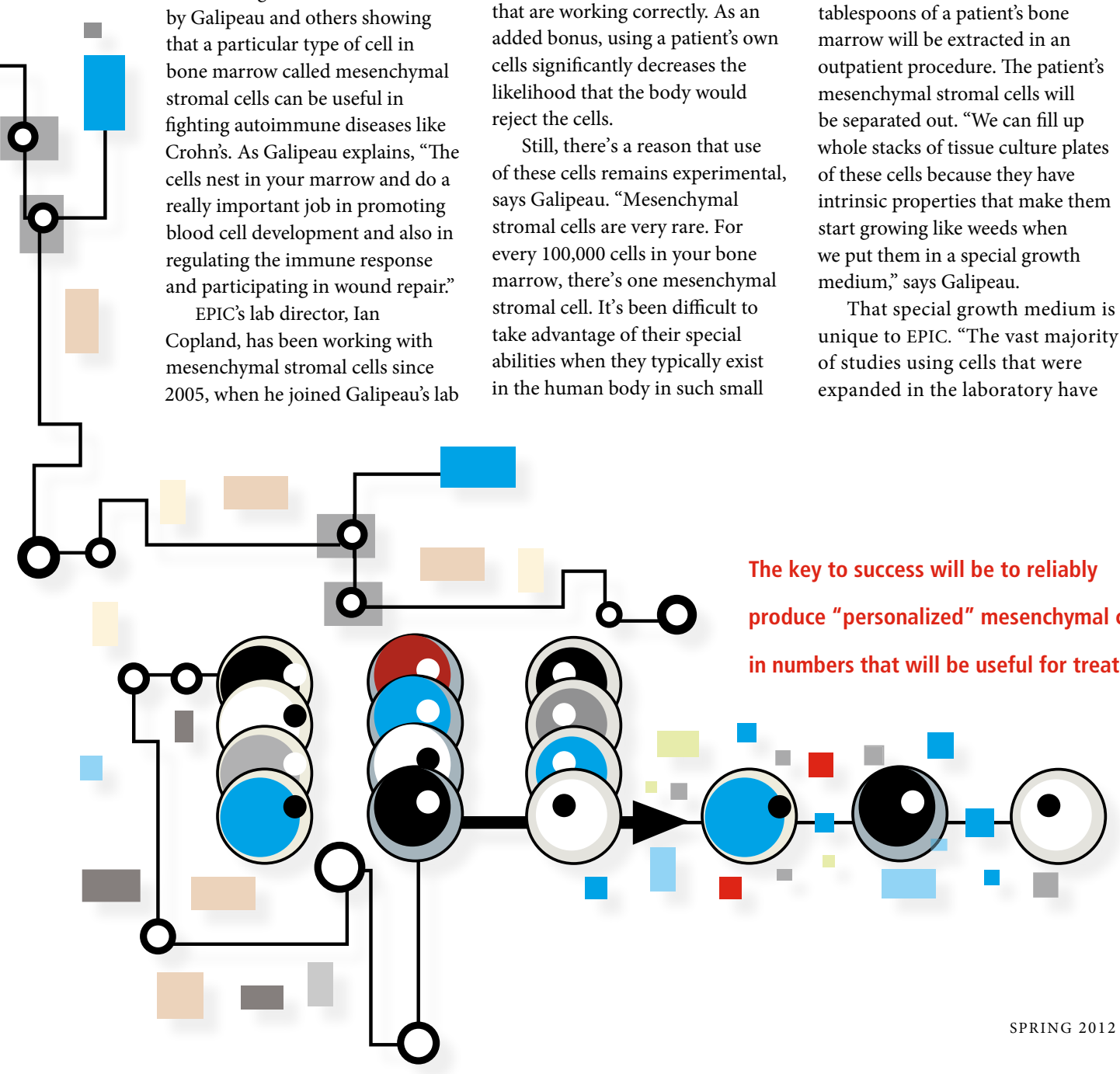
Unlike many treatments for autoimmune diseases, personalized cell therapy with mesenchymal stromal cells won't attack systems that are working correctly. As an added bonus, using a patient's own cells significantly decreases the likelihood that the body would reject the cells.

Still, there's a reason that use of these cells remains experimental, says Galipeau. "Mesenchymal stromal cells are very rare. For every 100,000 cells in your bone marrow, there's one mesenchymal stromal cell. It's been difficult to take advantage of their special abilities when they typically exist in the human body in such small numbers. The key to success will be to reliably produce 'personalized' mesenchymal cells in numbers that will be useful for treatment."

Mass-producing mesenchymal cells

Galipeau and Copland have come a long way in addressing the issue of producing mesenchymal cells in large numbers. Their first clinical trial, expected to start this year, will focus on young adults with Crohn's disease. A few tablespoons of a patient's bone marrow will be extracted in an outpatient procedure. The patient's mesenchymal stromal cells will be separated out. "We can fill up whole stacks of tissue culture plates of these cells because they have intrinsic properties that make them start growing like weeds when we put them in a special growth medium," says Galipeau.

That special growth medium is unique to EPIC. "The vast majority of studies using cells that were expanded in the laboratory have



The key to success will be to reliably produce "personalized" mesenchymal cells in numbers that will be useful for treatment.

EPIC's Ian Copland and Jacques Galipeau want to transform treatment for autoimmune disease by using the patient's own mesenchymal stromal cells.

used culture broth that incorporates cow blood extracts," says Copland. "We have developed a method using platelets from which we derive an entirely human protein extract. The extract allows for production of cells without use of bovine or other non-human growth factors."

In addition, Galipeau's team diverges from other studies in another important way. A few years ago, Galipeau realized that cells that were frozen and then thawed right before transfusion into patients were less effective than fresh cells. "We believe that giving live cells, though more labor intensive, will be much more potent than giving their thawed counterpart, which is more practical but possibly less effective," says Galipeau. "In our mind, cells are like sushi: fresh is best."

After a few weeks, doctors will harvest the resulting large crop of mesenchymal stromal cells and return them to the patient's body through a blood transfusion. "The pharmacological effect of receiving this very large dose of your own immune soldiers is that they hose down inappropriate autoimmune response," while leaving the appropriate immune response intact, says Galipeau.

Traditional drugs used to suppress parts of the immune system generally end up impacting the entire immune system. With drugs like cortisone, says Galipeau, "you're susceptible to complications that arise from a suppressed immune system." Depending on the autoimmune disease, patients may need one transfusion or repeated transfusions of mesenchymal stromal cells over time. Future studies at EPIC will focus on the optimal number, and eventually, Galipeau hopes, on diseases other than Crohn's, including graft-versus-host disease, lupus, and multiple sclerosis.

A resource for researchers far and wide

The work of growing and harvesting the cells will happen at EPIC's core facility on the sixth floor of Emory University Hospital. This facility is largely the work of Copland, who serves with Galipeau as a sort of co-captain for the EPIC team. A year after Galipeau came to Emory from Canada, Copland followed, drawn by Galipeau's vision for EPIC and ready to put the lab and its clinical trials together from the ground up. He oversaw the design and construction of EPIC's lab space in the hospital's blood bank, including a 350-square-foot, class-10,000 positive-pressure clean room (exists no more than 10,000 particles larger than 0.5 microns per cubic foot of air) to ensure good quality control.

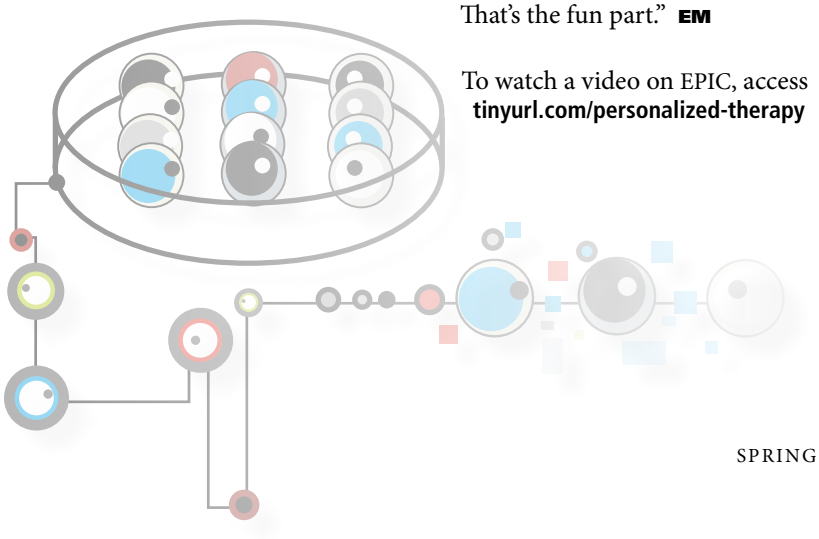
Says Galipeau, "There are virtually no other facilities in Georgia accessible to university researchers that will allow scientists to manufacture cells for personalized therapy and to test these as part of FDA-regulated innovative clinical trials. At this point, our research is meant strictly to enhance understanding of a technological platform which may have tremendous benefit, but is not 'owned' by anybody." EPIC's support is coming from Emory's School of Medicine and Children's Healthcare of Atlanta, with plans to apply for state and federal funds in the future.

Copland is hoping the facility stays busy not just with his team's research but also with the immunotherapy work of other scientists. He and Galipeau are viewing EPIC as a university and community resource for researchers who otherwise would have to turn to industry or stop altogether. Says Copland, "Usually promising academic research withers on the vine because it requires a huge investment to manufacture products like these in good conditions to allow for first-in-human studies. People start to look at the hurdles, and it never happens. The EPIC program will help get past that barrier from the bench to the bedside."

The team has begun collaborating with scientists not just at Emory but also at Georgia Tech, University of Georgia, and Georgia State University.

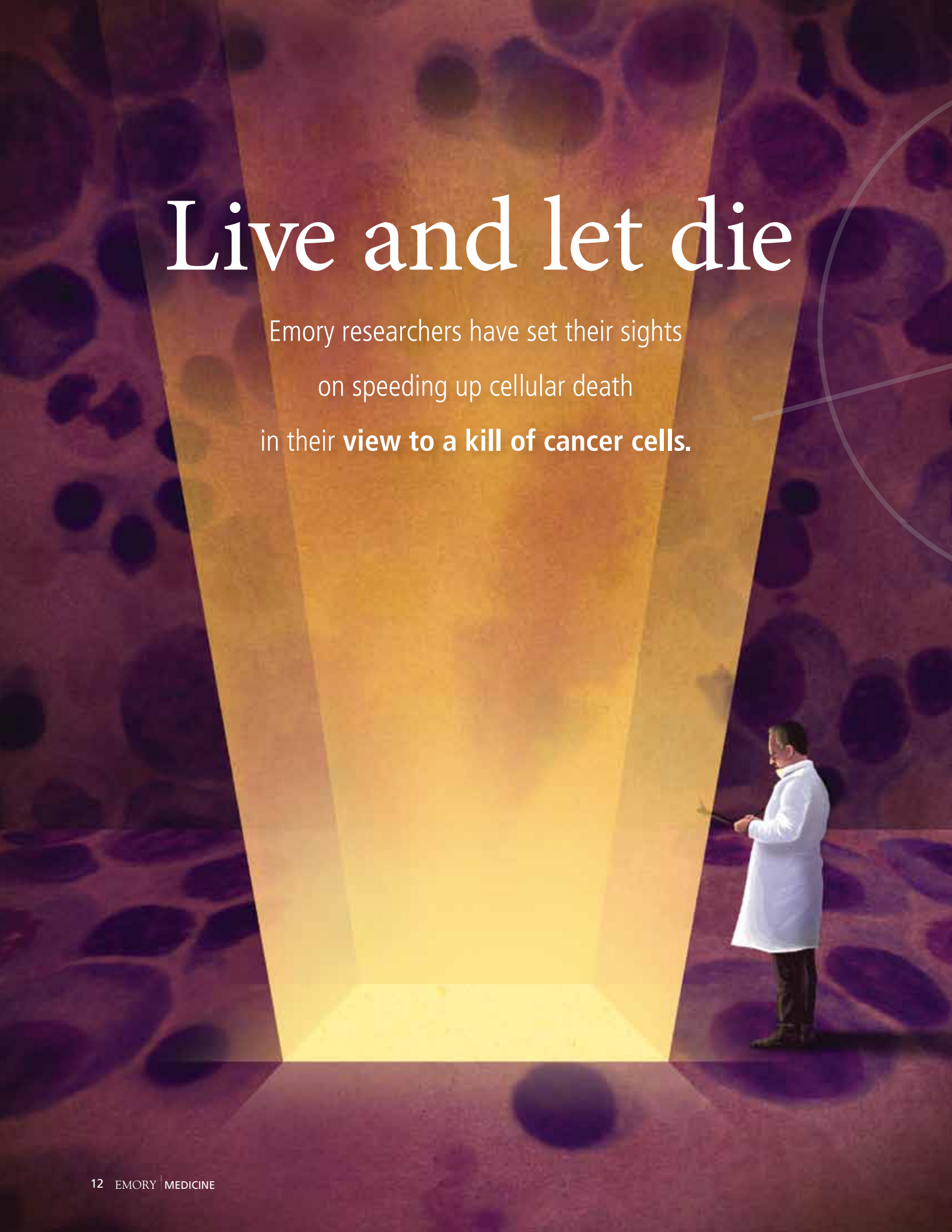
Within a few years, Galipeau hopes, he'll have study results showing the effectiveness of the mesenchymal stromal cells in patients, young and old, dealing with a range of ailments related to the immune system. Then he wants to expand EPIC's efforts into a different cellular platform. Other cells, like B-regulatory cells, show potential too if put in the right cellular boot camp. He thinks that advances at EPIC could lead to cellular therapy for not just immune system disorders but also infectious diseases and cancer. "And the vision is that we here at Emory would become the national go-to place for personalized cell therapies," says Galipeau. "It's just a question of lining up the ducks, bringing in the right people, and pushing the envelope. That's the fun part." **EM**

To watch a video on EPIC, access **tinyurl.com/personalized-therapy**



Live and let die

Emory researchers have set their sights on speeding up cellular death in their **view to a kill of cancer cells.**



By Robin Tricoles • Illustrations by Rob Dobi

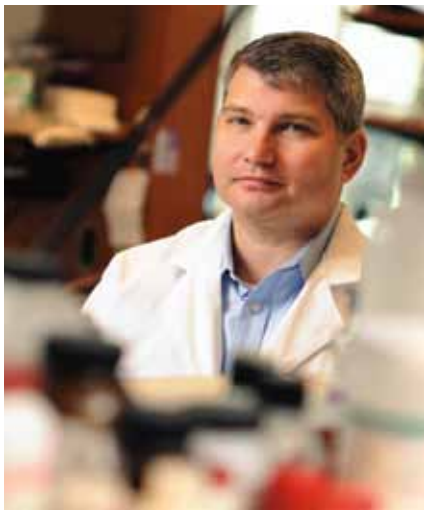
Like a sharpshooter zeroing in on a target,

Emory researchers are honing a new strategy to assassinate cancer cells. Their mission is to treat multiple myeloma more effectively, and they believe a vital clue in their quest lies in cellular garbage.

According to oncologist Sagar Lonial and oncology researcher Lawrence Boise, cells process unwanted proteins in their "garbage disposal"—known as a proteasome. Without a working disposal, the cancer cells die. The two are working to improve drug treatments that disrupt multiple myeloma cells' ability to clean up their waste by-products. Together they have a research program that takes new treatments for this deadly cancer from the lab to the bedside and back to the lab.

"We collaborate in the middle," says Boise. "Sagar takes what we learn in the middle, the translational part of research, and brings it to the clinic. I take what we learn in the middle and bring it back to the lab for deeper basic research."

Oncologist Sagar Lonial helped recruit researcher Lawrence Boise to Emory, and together they are researching myeloma treatments focused on cell proteasomes.



Oncology researcher Lawrence Boise is looking at ways to block the survival of some plasma cells left over after the drug bortezomib has attacked myeloma cells.

"I think the notion that bench to bedside is a one-way street is probably incorrect," says Lonial. "Bedside back to bench is probably as important, if not more important, to help understand the basic biology involved in an investigational therapy. Even in a failed trial you still learn something that will help you design the next treatment. So I tell patients when we're doing a phase 1 trial that I don't know if it's going to work, but we're going to learn something from it to understand better how to treat myeloma."

Lonial was already conducting clinical trials with the multiple myeloma drug bortezomib when Boise was at the University of Miami teaching undergraduate immunology and researching how cells decide to live or die.

Lonial and Boise met for the first time a few years ago at a conference on multiple myeloma where both made presentations. While awaiting flights home, the pair headed to the airport bar. Over a beer and a lengthy chat, the two decided to collaborate. Boise joined Lonial at Emory's Winship Cancer Institute in 2009.

Pushing the stress response

Bortezomib, one of the most effective drugs for relapsed multiple myeloma, impedes the work of proteasomes. Bortezomib's effect is straightforward—it causes cell stress, then cell death, and if the treatment works, remission of the cancer. Lonial and Boise believe one key to developing better myeloma treatments may be centered on proteasomes and are looking into how to better exploit the effects of bortezomib.

"There are always two responses to a stress response in a cell," says Boise. "The cell tries to alleviate the stress, or the cell recognizes it can't alleviate the stress, and it kills itself. In cancer therapy that would be a good thing. If you push the stress response hard enough, the response is to die."

Because plasma cells—myeloma cells are plasma cells run amuck—make and secrete more protein than other cells, they are particularly susceptible to the accumulation of misfolded proteins and thus sensitive to the proteasome inhibition brought on by bortezomib, explains Boise.

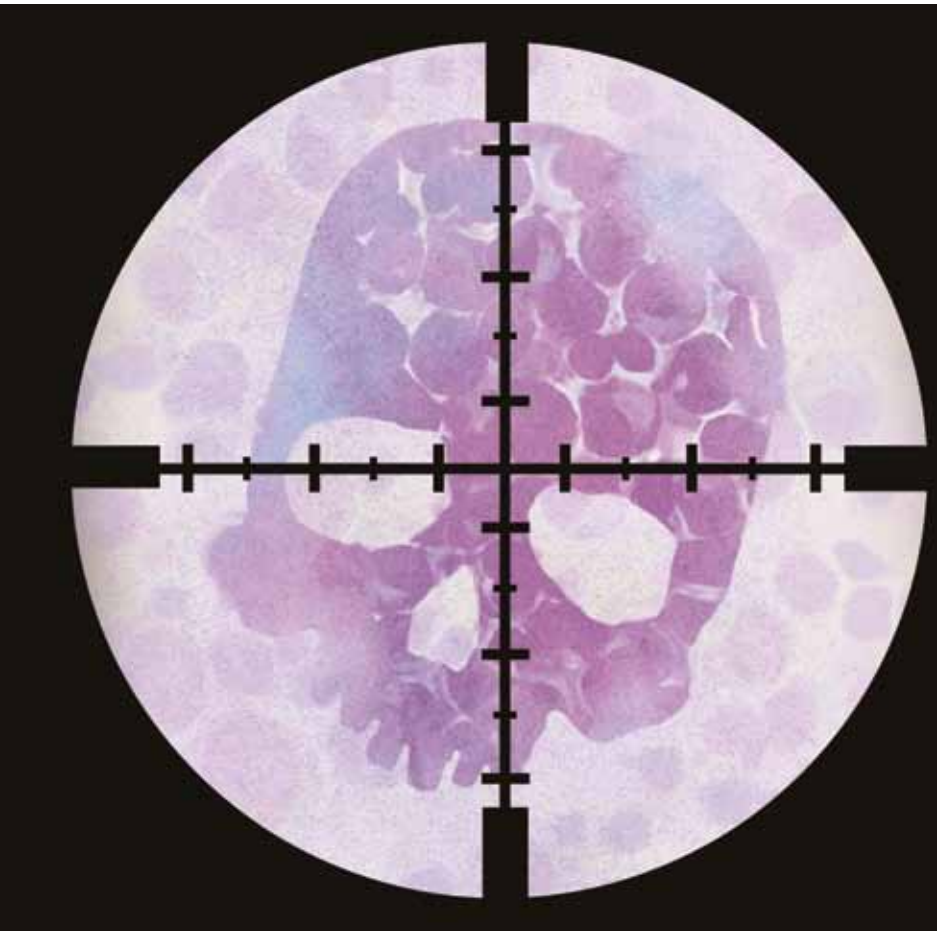
"Recent research points to the idea that by treating myeloma with proteasome inhibitors, we are really targeting the plasma cell biology, not the cancer cell biology," he says.

Bortezomib, however, is not effective in treating all types of multiple myeloma. That's because each type of myeloma has its own characteristics and may respond differently to specific drugs and therapies.

"There are some data coming out that show some patients may have four or five clones of myeloma," says Lonial. "Depending on their treatment one clone responds and then a different clone takes over, and you give another treatment and a different clone responds. It's a moving target."

Latch the hatch

No matter the type of myeloma in question, some plasma cells survive proteasome inhibition by using a so-called "escape hatch," really an alternate cellular pathway, to deal with unwanted protein accumulation. That is, the cells sequester unfolded or misfolded proteins into a ball known as an aggresome, which takes up residence in the intracellular space. "This sequestration prevents the misfolded proteins from interfering with normal cellular



"Even in a failed trial you still learn something that will help you design the next treatment. So I tell patients when we're doing a phase 1 trial that **I don't know if it's going to work, but we're going to learn something from it to better understand how to treat myeloma."**

–Sagar Lonial

function," says Boise.

So Boise and Lonial also are looking at ways of blocking this mechanism while inhibiting the proteasome. They are assessing the outcomes of ongoing clinical trials involving bortezomib and another drug, tipifarnib, as well as other combination drug therapies. While bortezomib goes after the proteasome, tipifarnib blocks the aggresome pathway, leading to a hefty accumulation of unwanted proteins in cancer cells and eventual cell death. Tipifarnib is not yet approved for treatment of multiple myeloma and is still in clinical trials.

"When you combine bortezomib with a secondary blocker, you get a whole lot more protein buildup, and the cell doesn't know what to do with it," says Lonial. "If the cell can't figure out how to cope, the apoptotic response will activate, and the cell will die."

Using a combination of drugs such as bortezomib and tipifarnib not only markedly increases protein accumulation, it also ups the odds of affecting more types of cancer cells, specifically, multiple myeloma's clones. "If subclone A is susceptible to drug X and subclone B is sensitive to drug Y, and if you use only one drug, one of the subclones will take over," says Lonial. "But if you use drugs X and Y, maybe you can knock both subclones down. Combination therapy represents the optimal management of this disease—the trick is what to combine."

In fact, one of the biggest research challenges, says Boise, is determining the number and identity of the best targets. "This disease is really multiple diseases," says Boise. "So that means there are going to be lots and lots of targets, and that means there's going to be lots of drugs to develop against those targets. The good news is that some of the targets for myeloma are the same targets for melanoma or lung cancer."

"We're interested in validating some of the things we described in the test tube with patients' samples," says Lonial. "Winship does this across the board with breast, lung, and other types of cancers. There are few diseases you can cure with one drug, but really understanding how to combine these drugs in patients is critical to our clinical mission." **EM**

A no-crack solution to aortic stenosis

A new alternative to open heart surgery brings together the disparate camps of interventional cardiologists and heart surgeons

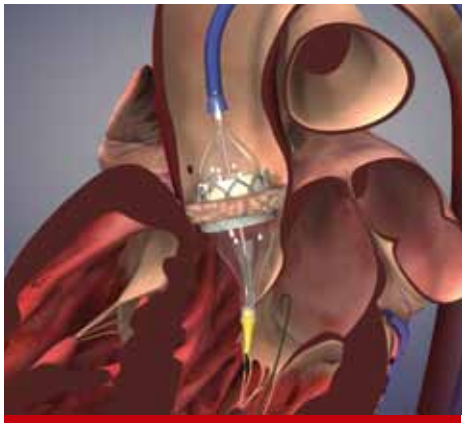
By Martha Nolan McKenzie

Izie Lang went to see his cardiologist when his shortness of breath got so bad that he couldn't walk from his house to his car without getting winded. The doctor diagnosed Lang with severe aortic stenosis—a narrowing of the aortic valve that results in restricted blood flow and immense strain on the heart. But at 93, Lang was deemed too old to undergo the surgery traditionally used to replace diseased valves.

So Lang's Jacksonville, Fla., cardiologist referred him to the Emory Heart & Vascular Center. There, a team of cardiologists and cardiac surgeons replaced his diseased valve with a new one via a nonsurgical procedure that snaked the new valve through an artery in his groin and up into place in his heart.

That was a little over a year ago. Today Lang is back to his old self—driving, socializing with friends at the local senior center, and going ballroom dancing at least three times a week. "I've got to say, I feel pretty good," says Lang.

Lang was part of a study that holds promise for patients with aortic stenosis who are too old or too sick to undergo surgery. Dubbed PARTNER, the FDA clinical trial measured a new nonsurgical procedure, transcatheter aortic valve replacement, or TAVR—against traditional open heart surgery. Emory University Hospital was one of 22 sites nationwide—and the only one in Georgia—in the PARTNER I study. PARTNER I is winding down, and patients now are being enrolled in PARTNER II.



The valve is pushed up into position in the heart, and when it is in place, a balloon inflates the stent, pushing the old valve out of the way.

Opposite page: Vinod Thourani, Vasilis Babaliaros, Robert Guyton, and Peter Block.

Snaking a new valve

"Aortic stenosis is progressive and relentless," says Vasilis Babaliaros, an interventional cardiologist and a co-principal investigator for PARTNER II. "Once you develop symptoms, you are dead within six months to three years without surgery. In the past, the only alternatives for these patients were hospice and palliative care." About 20% to 30% of those who suffer from aortic stenosis are considered ineligible as candidates for surgery.

TAVR offers another alternative. With TAVR, patients do not have to have their chest opened or their heart stopped and go on a cardiopulmonary bypass machine, as is required with a surgical valve replacement. Instead, the new valve is delivered via a catheter in one of two ways. If the arteries in the patient's groin are large enough, a catheter bearing a new bovine valve inside a collapsed metal mesh stent is inserted through the groin artery. It is pushed up into position in the heart, and when it is in place, a balloon inflates the stent, pushing the old valve out of the way. The balloon and catheter are removed, and the new valve takes over. If the artery in the groin is too small to accept a catheter, physicians make a small incision in the chest, over the tip of the heart, and feed the catheter through the heart into position. This procedure is more invasive than the groin option but still much less so than standard surgery.

The outcomes from both types of procedures are promising. In the PARTNER I trial, all nonoperative candidates received the TAVR procedure. Another group of patients considered at high risk were randomized between a traditional surgical valve replacement and TAVR. In the nonoperative group, mortality at one year fell from 50% to 30%. For high-risk operative patients, the one-year mortality rate with TAVR was roughly equal to the rate with traditional surgery, about 70%.

"These are good outcomes, especially when you consider how sick the patients are," says Peter Block, interventional cardiologist and a co-principal investigator for PARTNER I. "In fact, most of the deaths at one year were not from aortic

stenosis but from their associated conditions that made them inoperable or high risk in the first place. Their valves seem to be working just fine, but they are dying of cancers, lung disease, or coronary artery disease."

To get an idea of outcomes related strictly to the procedure, Babaliaros points to mortality at 30 days post-procedure. "Thirty days is a very special endpoint in surgical literature," he says. "Everything that happens to the patient from the day of surgery to 30 days out you blame on the procedure. The 30-day mortality of implanting the valve through the leg was half of that of traditional surgery for high-risk patients."

TAVR vs. the standard

Physicians caution that these results don't mean everyone should opt for TAVR over traditional valve replacement. "The standard surgical valve replacement is a known entity," says Robert Guyton, chief of cardiothoracic surgery at Emory Healthcare and a principal investigator for PARTNER I. "We've had experience with the surgery going back to the 1960s. We know how long the valve lasts. On the other hand, TAVR has just been around for about seven years, and we don't know how long the valves last. And the study showed a stroke rate about twice as high with TAVR as with standard surgery."

That stroke risk is still small, less than 10%, making TAVR an alternative for high-risk patients. "This is a major breakthrough in the treatment of patients who are considered nonoperative," says Vinod Thourani, a cardiac surgeon and a principal investigator for PARTNER II. "It allows us for the first time to offer an option to patients who in the past had no options."

The initial TAVR study results are so promising, in fact, that the FDA green-lighted the valve in early November. The valve is expected to revolutionize the treatment of severe aortic stenosis, says Thourani, who also sits on the national PARTNER II steering and publication committees.

Success also spawned the second phase, PARTNER II. This trial will look at the use of a smaller device as well as test the procedure in healthier patients—those who pose a moderate surgical risk. The latter may help researchers determine how long these new valves can be expected to last.

"We don't know how long the transcatheter valves last because most patients who get them don't live that long due to their other conditions," says Babaliaros. "The longest survivor that we know of is a Parisian woman who has had the valve about eight years. But when we start implanting these valves into moderate-risk patients, they could well live longer, allowing us to track the valves over more years."

> This is truly a new paradigm. The cardiologists are teaching the surgeons catheter skills, and the surgeons are teaching the cardiologists about the surgical management of aortic stenosis. —Vinod Thourani

Dissolving fixed borders

Emory physicians laid the groundwork for the TAVR procedure years ago, arguably going back several decades. Block began investigating structural heart and valve disease in the early 1980s and was the first physician in the United States to dilate the mitral valve. He also had a connection with the French physician Alain Cribier, who pioneered the TAVR procedure in 2002, and he was able to arrange for Babaliaros, then a fellow under Block, to go to France for a year to work with Cribier.

"Not only was I involved in the implants—we did patients No. 17 to No. 40 the year I was there—but we spent so much time writing together that I got to walk around in the mind of the pioneer," says Babaliaros, now an interventional cardiologist. "I got to understand the spirit of the procedure, the goals, the limitations, and the future of the device."

After Babaliaros returned to Emory in late 2005, he and Block decided to set up a structural heart disease program and to try to land a place in the new PARTNER trial.

"The procedure kept evolving—one way the procedure is done more interventional cardiology, the other way is more surgical so we put a team together of cardiologists and surgeons that would understand both aspects," Babaliaros says.

They were joined by cardiac surgeons Guyton and Thourani, along with one research coordinator and one fellow. "Even with that small team, we were not only able to get into the trial, but we were one of the largest enrollers, with close to 200 patients so far, " says Babaliaros.

Much of that success stems from collaboration between formerly disparate camps. "This is truly a new paradigm," says Thourani. "The cardiologists are teaching the surgeons catheter skills, and the surgeons are teaching the cardiologists about the surgical management of aortic stenosis."

Says Babaliaros, "In the past, there have been fixed borders between cardiologists and cardiac surgeons. They use a knife and sutures, we use catheters and small needles. But with TAVR, we have come together—a cardiologist and cardiac surgeon work together for each case. As a result, I think, the whole is much bigger than the sum of the parts." **EM**

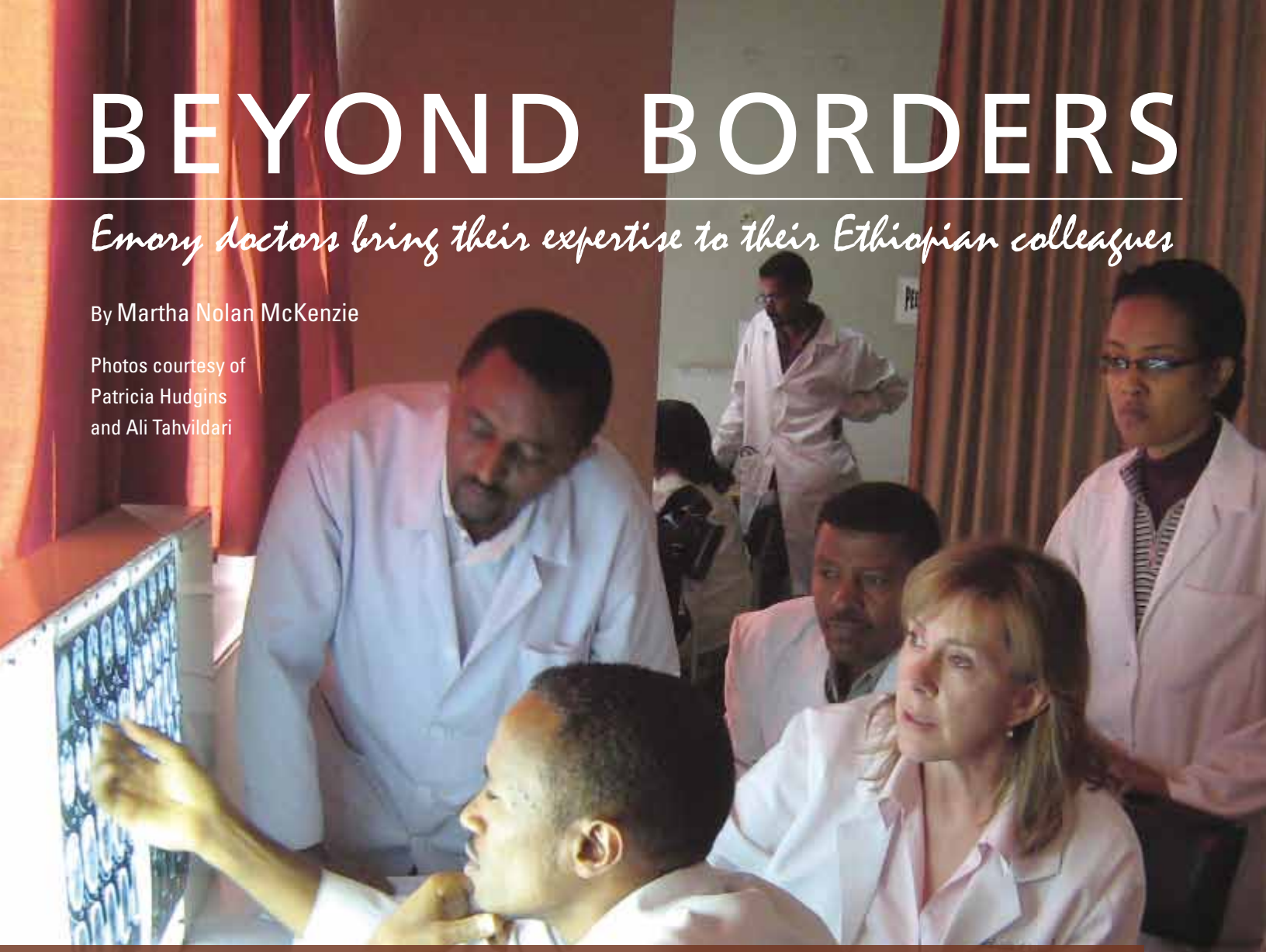
To watch a video on TAVR, access **tinyurl.com/TAVR-patient.**

BEYOND BORDERS

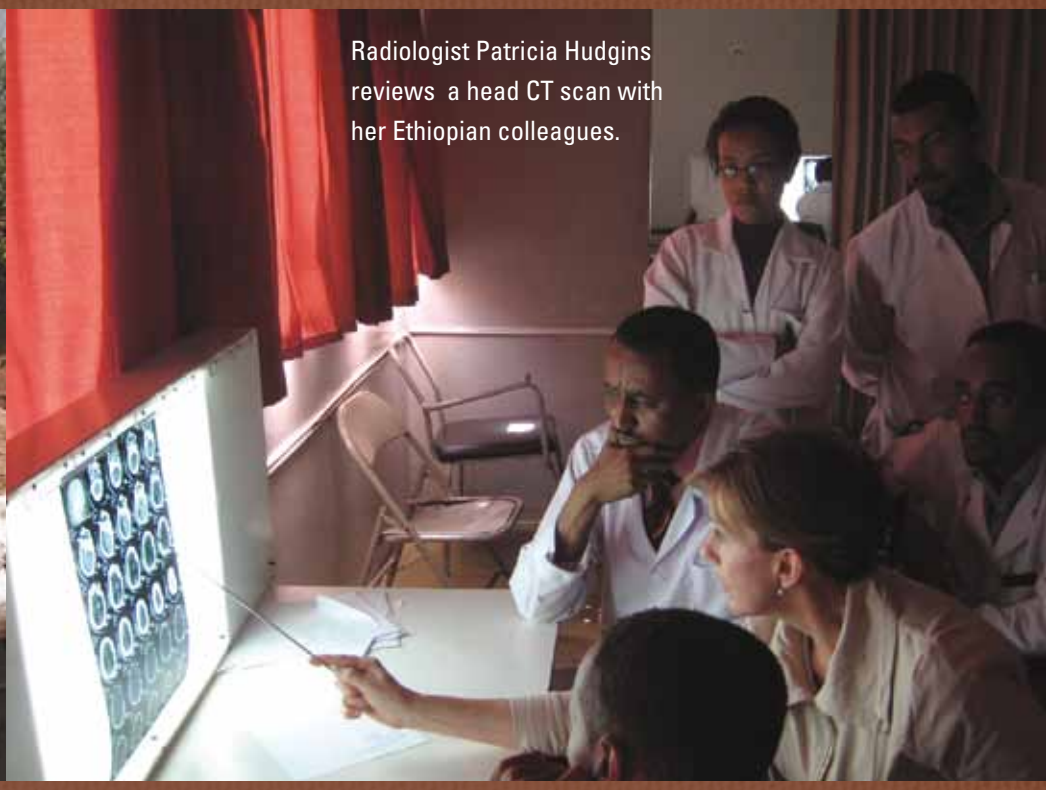
Emory doctors bring their expertise to their Ethiopian colleagues

By Martha Nolan McKenzie

Photos courtesy of Patricia Hudgins and Ali Tahvildari



The gaunt teenage boy lay on the cot, his dark eyes registering only mild interest when the medical team parted the red and white candy-striped curtain that separated him from the other patients and approached. Patricia Hudgins, an Emory radiologist, Dominique Cosco, an Emory general practitioner, and three Emory residents greeted the boy and his father, who stood next to the bed clutching a soiled bag containing his son's medications and a much-folded, stained X-ray.



Radiologist Patricia Hudgins reviews a head CT scan with her Ethiopian colleagues.

When the clinicians held the rumpled film up to a window, they saw a massively enlarged heart. This, along with the boy's shortness of breath and distinctive heart murmur, confirmed the diagnosis of rheumatic heart disease and symptomatic heart failure. Back at Emory, the teen would have been scheduled for a heart valve replacement. But they were not at Emory. They were in the sparse emergency room of Black Lion Hospital in Addis Ababa, Ethiopia. Here, the best they could do was recommend that his symptoms be managed medically in the hospital, realizing that he would likely have to remain on his ER cot for several days before a hospital bed became available.

Welcome to medicine in Ethiopia, where there is one qualified doctor for every 35,000 people.

Welcome to medicine in Ethiopia, where there is one qualified doctor for every 35,000 people and where the advanced life-saving equipment and technology that are the stock and trade of U.S. health care are either very rare or nonexistent.

"The practice of medicine here is marked by lack—lack of human resources, lack of physical resources," says Hudgins. "Yet the health care practitioners here are amazing in how much they are able to do with so little."

A growing contingent

Hudgins and Cosco are part of Emory medical school's rapidly growing involvement in Ethiopia, aimed at helping address that dearth. The lion's share of Emory's Ethiopian efforts center on a medical education exchange program funded by a U.S. government grant to the country's largest medical school, Addis Ababa University (AAU). Emory also has received funds from the Bill & Melinda Gates Foundation for a project involving maternal and child health. And the dean of the School of Medicine has pledged more support through the Emory Global Health Residency Scholars Program.

"There are more Ethiopian doctors practicing in the United States than in Ethiopia," says Henry Blumberg, an Emory infectious disease specialist and epidemiologist. "Physician shortage is a huge problem there, along with challenges in medical education and training, all problems that Emory is helping to address. We don't want to be involved in medical tourism. Our goal is to make a difference."

The medical school's ramped-up efforts in Ethiopia began about two years ago. In January 2010, Emory was awarded an open-ended grant through the Bill & Melinda Gates Foundation to "…do something related to maternal and child health," says Blumberg. "So we went to Ethiopia with money but no project. Our colleagues at AAU decided they wanted to put the funds toward making magnesium sulfate available to pregnant women for the treatment of pre-eclampsia and eclampsia."

Pre-eclampsia is routinely treated in the United States and throughout the world with magnesium sulfate, "a pretty old

and very cheap drug," says Blumberg. For reasons that are not clear but likely related to profitability, there are no manufacturers or importers of the drug in Ethiopia. As a result, pre-eclampsia and eclampsia are the number two causes of maternal mortality in Ethiopia, behind hemorrhage.

Upon learning of AAU's desired focus, Blumberg, an infectious disease specialist, recruited the aid of Jennifer Goedken, an Emory urogynecologist. Goedken, Blumberg, and their team developed a standardized protocol for the drug's use and created teaching materials in the form of posters and pocket cards. The original plan called for introducing magnesium sulfate use in Addis Ababa University's three teaching hospitals (Black Lion, St. Paul's, and Gandhi), but the AAU-Emory team also arranged partnerships with the Ethiopian Ministry of Health, the Ethiopian Society of Obstetricians & Gynecologists, and UNICEF. The influence of that partnership resulted in magnesium sulfate use being implemented in 107 public hospitals throughout the country.

We don't want to be involved in medical tourism. Our goal is to make a difference.

This accomplishment, while laudable, pales when you consider that nearly 90% of the births in Ethiopia occur in the home. "The next step is to find a way to take magnesium sulfate beyond the hospital and into the community," says Goedken. "We've put together a proposal for a pilot project to train community health workers to diagnose pre-eclampsia so they can refer patients to health centers. Emory already has a Gates grant through the nursing school to create a community-oriented strategy to improve maternal and newborn health in rural Ethiopia. We would like to add education about diagnosis and treatment of pre-eclampsia to what they are already doing."

Separately in 2010, the National Institutes of Health unveiled a new initiative to strengthen medical education in sub-Saharan Africa. AAU garnered one of the five-year $10 million grants and chose to partner with Emory, along with three other U.S. universities. AAU is looking to Emory to help it meet two recent government mandates, increase the number of medical students and doctors trained each year and increase the number of subspecialties in which graduates can train. AAU's medical classes jumped from 100 to 300, though its faculty count remained the same, and no faculty are trained in many of the subspecialties that are being planned.

Emory is approaching the task on a department-by-department basis. The Gyn/OB department, for example, met with their counterparts at AAU and discovered that while there is a residency program, there are no fellowships, particularly in the much-needed specialty area of gynecologic oncology. So in addition to Emory Gyn/OB faculty and residents giving lectures and doing teaching rounds, they are develop-

Radiologist Patricia Hudgins with infectious disease specialist Admasu Tenna.

ing a curriculum for a gyn-oncology fellowship at AAU.

"Cervical cancer is a very big issue here because they don't have Pap smears to detect precancerous stages, and they don't have the resources to treat advanced stages of the disease," says Goedken. "But beyond that obvious need, postgraduate training in a subspecialty such as gynecologic oncology can be a powerful tool in retaining faculty at Ethiopian medical schools. It gives them a path for advancement that they might not have had before."

Many other Emory medical departments are in various stages along the same path. These include the departments of medicine (including infectious disease, pulmonary medicine, general medicine, and cardiology), radiology, surgery, pathology and laboratory medicine, and pediatrics (specifically, pediatric infectious diseases).

The exchange of knowledge was equally valuable both ways.

Back to the basics in radiology

Some departments have an easier time translating their skills and services than others. "If you are an infectious disease doctor who vaccinates kids against pertussis or gives TB medicine, there is a lot of opportunity for you to do global outreach," says Hudgins. "You carry your stethoscope and medicine in your backpack. But if you're a radiologist who uses $3 million MRIs, $1 million CT scanners, and $35,000 ultrasound machines, your outreach opportunities are a little more limited."

When Hudgins and an Emory radiology resident arrived at Black Lion Hospital in March, they found one only CT scanner, which worked intermittently, a handful of ultrasound machines, and some film X-ray machines. No MRI. So even though the residents and faculty they encountered were extremely well-read, their hands-on experience was limited.

Yet the exchange of knowledge was equally valuable both ways. "None of my residents had ever touched a film X-ray before—it's all digital these days," says Hudgins. "And there is no file room in these hospitals. The patients are given their X-ray films, and they take them home with them and bring them back to future appointments. So the patient just hands you his film, and you're reading it with him right next to you. That's highly unusual in the United States where radiologists are usually off in our own corners. But it is exciting and helps remind us of what we've lost with all the subspecialization in medicine in the United States."

Hudgins will be returning to AAU to help set up fellowship training in neuroradiology. "I'm putting together my suggestions for a one-year training program in neuroradiology," she says. "Another Emory radiologist, Aarti Sekar, will lecture on body imaging—abdomen, chest, and pelvis. So we are slowly bringing more expertise in more areas."

Training general surgeons

Surgery is another specialty that doesn't translate as readily as others, but that has not stopped several members of Emory's surgical team from making the trek, including Jonathan Pollock, a general surgeon. Pollock moved to Ethiopia in July through the Pan-African Academy of Christian Surgeons, which trains African doctors for five years to become general surgeons.

Like Hudgins, Pollock sees outreach opportunities that extend beyond the obvious. "There is a focus on infectious disease as a driving force of public health," he says. "But there has increasingly been recognition that surgery is an important component of this."

In Africa, you have to be a true general surgeon and operate with only a few different instruments.

Pollock is not spending his time training surgeons to perform open heart surgery; rather he is working to develop proficiency in Cesarean sections, treatment of ulcers and fractures, and laparoscopy. One common problem for surgeons in Ethiopia is a typhoid perforation of the bowel.

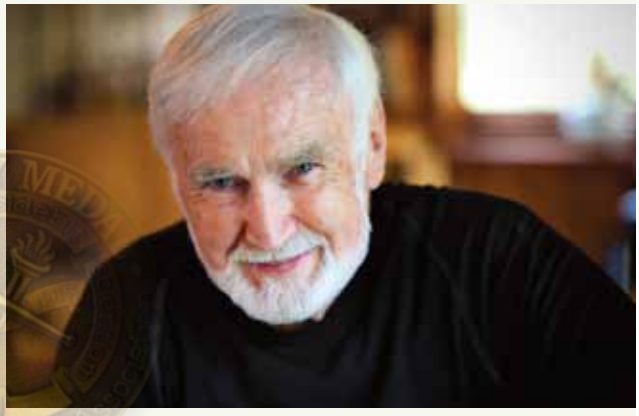
"Not every surgical technique needs to be done by a fully trained [by Western standards] surgeon," says Pollock. "While there is increasing specialization in Western medicine, with different clamps and forceps for every conceivable situation, in Africa, you have to be a true general surgeon and operate with only a few different instruments."

So far Pollock's program has trained four surgeons, two of whom have remained in the country. One is a general surgeon in rural Ethiopia—the only surgeon at the local hospital—and another is practicing in western Ethiopia in his hometown of 100,000 people where he is the town's very first surgeon.

Emory medical school's already significant presence in Ethiopia is set to expand, thanks to School of Medicine Dean Thomas Lawley's recent commitment to fund the Emory Global Health Residency Scholars Program. These funds will support Emory residents and fellows to travel to Ethiopia, provided they have a link with an Emory faculty member. "This will really expand the number of people who will be able to go," says Blumberg. "When it's up and running, it will involve a series of monthly seminars in Atlanta and a one-month rotation in Ethiopia."

Whether participating residents and fellows decide to pursue a career in global health or not, their time in Ethiopia will surely change them as physicians. "It's so valuable to learn how medicine is practiced in other parts of the world, and we can bring that knowledge back to the United States," says Cosco. "Physicians need to be creative about how to best deal with resource-limited patients. Here in Atlanta, at Grady Hospital, we have lots of patients who don't have the funds to buy needed medicines or who have low health literacy. Global health can happen right across the street." **EM**

Class Notes



James Turpin 49C 51T 55M, of San Diego, received one of two 2011 Emory Medals, the highest award given to alumni for achievements in community service or a professional field. In 1961, Turpin volunteered at a Tijuana clinic and saved the lives of two small children who were dying of pneumonia. The experience led him to found Project Concern International (PCI), a humanitarian organization committed to health and preventing disease in developing countries. He officially started PCI in China after converting a 62-foot floating barge into a health clinic named Yauh Oi (Brotherly Love) on the Hong Kong harbor. PCI now operates in 19 countries, reaching more than 5.5 million people. Though he is retired, Turpin continues to volunteer at PCI spots around the world. Last year he also was named one of Emory's "175 Makers of History" in honor of the university's 175th anniversary.

Amos Anderson 76M 81MR

David Clapham 79G 81M

1960s

Cecil Wilson 57C 61M was elected president of the World Medical Association for 2012-2013. He is a retired internist in Winter Park, Fla., and is a former president of the American Medical Association.

1970s

Amos Anderson 76M 81MR is president of the Georgia Urological Association. He practices in Macon.

Brenda Fitzgerald 77M 81MR was named commissioner of the Georgia Department of Public Health.

1980s

David Clapham 79G 81M was appointed to the Scientific Advisory Board of Pulmatrix, a clinical stage biotechnology company. He is a cardiovascular researcher at Harvard University.

David Langford 83M and **Alexander Justicz 86M 88MR 92MR 95MR** have been named lead surgeons at Gwinnett Medical Center's Strickland Heart Center, which began offering open heart surgery in January. The medical center is located in Lawrenceville, Ga.

Mitchell Garber 87M, of Atlanta, recently was named a senior managing consultant with Engineering Systems Inc., an engineering and scientific investigation and analysis firm. Previously he was a medical officer for the National Transportation Safety Board and a U.S. Air Force flight surgeon.

John Wright 85C 89M will start planting a 30-acre vineyard in the Davis

John Wright 85C 89M

Audrey Schuetz 00M 00PH 07MR

David Feig 94C 98PH 02M

John Heflin 05M 08MR 10MR

Mountains of Texas in April. He describes the location as "a beautiful place hardly visited by humanity until I make it into a 'wine destination.'" He is a radiologist in San Antonio.

2000s

Audrey Schuetz 00M 00PH 07MR is now a certified diplomate of the American Board of Medical Microbiology. She is assistant director of the clinical microbiology laboratory at Weill Cornell Medical College and NewYork-Presbyterian Hospital.

David Feig 94C 98PH 02M was listed as one of Seattle's top doctors of 2011 by *Seattle Met* magazine.

Robert Rogers 02M recently joined the faculty of the University of Colorado. He is an interventional cardiologist.

John Heflin 05M 08MR 10MR and **Samuel Willimon 05M** have joined Children's Healthcare of Atlanta. Both are pediatric orthopedic surgeons.

Ginger Merry 06M 06PH traveled to Uganda in September as a project manager for Imaging the World, a not-for-profit that gives low-cost portable ultrasound machines to developing countries. This year she will move to Chicago for a breast imaging fellowship at Northwestern University.

MARRIED: Thomas Caggiano 08M to Ashley Norman on July 16, 2011. Caggiano is an anesthesiology resident at NYU Langone Medical Center.

Ginger Merry 06M 06PH

Carlos Del Rio

James Gulley

Residency Notes

Jerry Cohen (anesthesiology) was named president of the American Society of Anesthesiologists. He is an associate professor at the University of Florida College of Medicine and specializes in transplant anesthesia.

Carlos Del Rio (internal medicine) was appointed to the board of the Atlanta Symphony Orchestra. He is chair of the Hubert Department of Global Health at the Rollins School of Public Health at Emory, co-director of the Emory Center for AIDS Research, and a professor of infectious disease at the medical school.

James Gulley (internal medicine) received a Presidential Early Career Award for Scientists and Engineers for the Department of Health and Human Services. He is a senior investigator at the Center for Cancer Research of the National Cancer Institute.

Alma Jenkins (gastroenterology) has returned to her hometown of Smithfield, N.C., to open her new practice, Johnston Medical Associates Gastroenterology.

Class Notes | alumni news

Ravi Patel

Nanette Wenger

Goodwin Breinin 40G 43M

Ravi Patel (pediatrics) joined the faculty of Emory's School of Medicine as an assistant professor in the Division of Neonatology.

Roderic Pettigrew (internal medicine) received the 2011 Distinguished Achievement Award from the Biomedical Engineering Society. He is the director of the National Institute of Biomedical Imaging and Bioengineering at the National Institutes of Health.

Nanette Wenger (cardiology) was awarded the James B. Herrick Award from the American Heart Association for her impact on clinical cardiology.

Justin Young (internal medicine) competed on CBS's *Amazing Race 19,* which aired this past fall.

Deaths

1930s

Wade Cline 39M, of Birmingham, Ala., on June 25, 2011. He was 96. He was an obstetrician and gynecologist for 50 years. He is survived by his wife, Anita, five sons, 16 grandchildren, and 10 great-grandchildren.

1940s

Paul Brookshire 42M, of Kingsport, Tenn., on Nov. 28, 2011. He was an ENT physician in Kingsport for 33 years. He is survived by his wife, Lois, five daughters, a son, 10 grandchildren, and eight grandchildren.

Goodwin Breinin 40G 43M, of New York, on Dec. 14, 2011. He was 93. He served as chair of the ophthalmology department of the New York University medical school from 1959 to 2000 and remained a professor until 2006. He authored more than 100 papers and received the American Medical Association's Knapp Medal for Contributions to Ophthalmology and the Emory Medal. He was preceded in death by his wife, Rose-Helen, and is survived by two children and four grandchildren.

William Hutchinson 40C 43M, of LaGrange, Ga., on March 27, 2011. He practiced general medicine in LaGrange but recognized the need for a certified obstetrician/gynecologist in the area so he pursued a second residency. He became the city's first ob/gyn in 1954. He is survived by his wife, Morrill, three sons, and seven grandchildren.

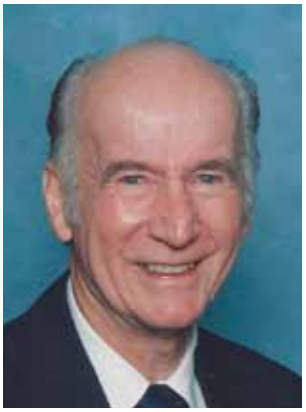
George Stubbs 41C 43M, of Waynesville, N.C., on Oct. 26, 2011. He practiced surgery for 36 years at Riverside Hospital in Jacksonville, Fla. He is survived by his wife, Beverly, two daughters, one grandson, and two great-grandchildren.

L. Rowe Driver 42C 44M, of Nashville, on Jan. 4, 2012, of cancer. After serving in WWII and the Korean War, he practiced ophthalmology for more than 40 years. He is survived by his wife, Elizabeth, a daughter, and two grandchildren.

Hubert Strickland Jr. 43C 45M, of Dothan, Ala., on Oct. 6, 2011. He was 90. After serving in WWII, he returned to Alabama to serve as a general practitioner at Tippins Hospital. He became the sole owner of the hospital, which was later renamed Hartford Hospital. He later opened the Strickland Clinic, and his wife, Louise, worked as a receptionist there. They worked side by side for 55 years. He retired at age 83. In addition to being survived by his wife, he is survived by two sons and four grandchildren.

Samuel Denham Jr. 44C 46M 49MR 53MR, of Jacksonville, Fla., on July 23, 2011. He served as president of the Florida OB/GYN Society and the Florida Division of the American Cancer Society and was a fellow of the American College of Obstetrics and Gynecology. He was preceded in death

Deaths | alumni news



Walter Dunbar 45C 48M 53MR

George Goza 50C 54M 57MR 58FM 62MR

by his wife, Elizabeth, and is survived by his son, three daughters, and two granddaughters.

Jackson Landham 45C 47M, of Griffin, Ga., on Nov. 15, 2011. During the Korean War, he served in the U.S. Medical Corps. While in Europe, he was selected to attend the first International Congress of Cardiology and the first International Congress of Internal Medicine. He is survived by his wife, Margaret, four children, eight grandchildren, and seven great-grandchildren.

Walter Dunbar 45C 48M 53MR, of Atlanta, on July 5, 2011, of lymphoma. He was 86. He was preceded in death by his wife, Helen, and is survived by three children, including son **Mark 76C 80M 84MR**, and five grandchildren, including Mark's daughter, **Kristen 05C 12M**.

1950s

Marion Pittard 47C 50M, of Toccoa, Ga., on Aug. 4, 2011. He was 85. He was certified by the American Board of Family Practice and was a clinical assistant professor of preventive medicine and community health at Emory. He also opened a clinic for treatment of addiction. He is survived by his wife, Maridan, three daughters, a stepson, nine grandchildren, and four great-grandchildren.

Robert Cain 50C 53M, of Quitman, Ga., on July 29, 2011. He was 87. He was preceded in death by his wife, Marie, and is survived by a son, daughter, and one grandchild.

Hans Engel 53M, of Mission Hills, Calif., on June 21, 2011. He was 87.

Thomas McMillan 50C 53M, of Charlotte, N.C., on Nov. 6, 2011. He practiced internal medicine at the Charlotte Medical Clinic from 1958 to 1992 but continued to work at several satellite clinics until he was in his mid-70s. He was preceded in death by his wife, Alice, and is survived by two sons and three grandchildren.

Sidney Sellers III 50C 53M, of Dalton, Ga., on Dec. 9, 2011. He was 85. He and his partner were the first board certified obstetricians/gynecologists north of Atlanta in 1957, when they set up practice in Dalton. Sellers practiced until 2007. He is survived by his wife, Kathryn, three children, two step-children, seven grandchildren, and five step-grandchildren.

George Goza 50C 54M 57MR 58FM 62MR, of Rice Lake, Wis., on Oct. 19, 2011. He was 85. He is survived by his wife, Kathleen, a son, a daughter, and three granddaughters.

John Pruitt Sr. 53C 56M, of St. Petersburg, Fla., on Oct. 8, 2011. He was a thoracic and cardiovascular surgeon who invented the

Deaths | alumni news

Pruitt-Inahara shunt and an irrigation embolectomy catheter. He donated millions to the University of Florida's biomedical engineering department, which was named after him, and its medical center. He also gave $2.8 million worth of land to Eckerd College in St. Petersburg. During his lifetime, Pruitt bought close to 100,000 acres. He is survived by his son, two daughters, five grandchildren, and one great-grandchild.

Arthur Gabriel 57M, of Tenafly, N.J., on Sept. 14, 2011. He was 79. He was an associate professor of psychiatry at Mt. Sinai Hospital. He is survived by his wife, Linda, three children, and four grandchildren.

Randolph Carter 55C 59M 64MR, of Amelia Island, Fla., on Aug. 27, 2011. He was an ophthalmologist in the Deland, Fla., area for 25 years. He is survived by his wife, Charlotte, and six sons.

James Forbes 55C 59M, Clewiston, Fla., on Aug. 8, 2011. He was 78. He practiced for 45 years as one of the area's last rural family practice doctors—delivering babies to performing general surgery. In 1999, he received the Wendell N. Rollason Service Award from the Florida Rural Health Association, and in 2007, he received the Florida Hospital Association's Lifetime Heroic Achievement Award. He is survived by his wife, Janice, a son, two daughters, eight grandchildren, and one great-granddaughter.

1960s

Louis Orr Jr. 60M, of Gainesville, Fla., on Oct. 23, 2011. He was a urologist for more than 27 years. He is survived by his wife, Ann, four children, and six grandchildren.

Thomas Bryant Sr. 58C 62M 63MR 67L, of Newcomb, Md., on Dec. 9, 2011, of injuries sustained in a car accident. He was 75. He, along with First Lady Rosalynn Carter, led the President's Commission on Mental Health, an advisory board that called attention to the shortcomings of mental health care in the late 1970s. Faced with the threat of spending cuts for mental health training and only a modest increase in research funds in 1978, he and the first lady just showed up at the Office of Management and Budget. After a meeting, funding for research related to drug and alcohol abuse and mental health increased from $11 million to $40 million.

Bryant later worked on mental health issues with the Carter Center's Mental Health Task Force and the Rosalynn Carter Institute for Caregiving. He also served as president of the National Foundation for Mental Health.

He is survived by his partner, Albert, a son, daughter, and six grandchildren.

Everett Veach 58C 62M 70MR, of Anniston, Ala., on Aug. 19, 2011, of leukemia. He was an orthopedic surgeon. He is survived by his wife, Dorothy, a daughter, two sons, and five grandchildren.

1970s

Stephen Feldman 74M, of Short Hills, N.J., on June 27, 2011. He is survived by his wife, Arlene, and four sons, including **Evan 06M**.

Nicholas Mamalis 77M, of Tulsa, Okla., on June 25, 2011, of renal cell cancer. He was 58. He practiced at St. Francis Hospital in Tulsa for 28 years and was an avid traveler who visited 35 countries. He is survived by his wife, Carla, and two daughters.

1980s

Fred Sabsowitz 80M 82MR, of Stockbridge, Ga., on July 8, 2011, of leukemia. He was 62. After earning a physician's assistant degree from Yale, he worked in Emory's Department of Pathology. He found pathology so interesting that he enrolled in the School of Medicine. He was director of pathology at the Henry Medical Center in Stockbridge for 25 years. He is survived by his wife, Susan, and a son and daughter.

1990s

Steven Taraszka 95M, of Monroe, Ga., on Nov. 19, 2010. He is survived by a daughter, his parents, and two siblings.

Residency Deaths

John Brinson (internal medicine) of Monticello, Fla., on July 17, 2011. He practiced at the Gerry Medical Center in Monticello for 30 years. He is survived by his wife, Joyce, and one son.

Wendell Buckhaults (ophthalmology) of Savannah, Ga., on March 27, 2011. He served in many positions at Candler Hospital. He is survived by his wife, Catherine, two sons, and four grandchildren.

Nobel David (neurology), of Coral Gables, Fla., on Nov. 30, 2011. He was

83. He was a professor of neurology at the University of Miami and chief of neurology service at the Miami VA Medical Center. He was known for pioneering fluorescein angiography, a method of detecting and locating strokes by photographing dyed blood in the small blood vessels of the retina, used before the invention of CT scans and MRIs. He is survived by his children and grandchildren.

James Everett (pediatrics) of Lakeland, Ga., on July 20, 2011. He was 58.

Francisco Gonzalez (obstetrics/gynecology and pathology) of Woodstock, Ga., on Nov. 5, 2011. He is survived by his wife, Gloria, two daughters, and three grandchildren.

Abraham Kaplan (thoracic surgery) of Norfolk, Va., on Feb. 9, 2011. He was 85.

Archie Morris (general surgery) of Vidalia, Ga., on Aug. 10, 2011. He was 81. He is survived by his wife, Clio, four children, two step-children, and 12 grandchildren.

Tet Pang (thoracic and cardiovascular surgery) of San Francisco, on Sept. 19, 2011, of complications of Parkinson's disease. He practiced at Fairview General Hospital in Cleveland for 25 years. He is survived by his wife, Anna, a son, daughter, and four grandchildren.

John Schellack (general surgery) of Cumming, Ga., on Oct. 10, 2011. He practiced at the former Crawford Long Hospital for close to 50 years. He was preceded in death by his wife, Mary Elizabeth, and is survived by four children, nine grandchildren, and three great-grandchildren.

William Senter (internal medicine) of Raleigh, N.C., on May 28, 2011. He was 93. He practiced internal medicine until age 77. He is survived by his wife, Bettye, three daughters, a son, seven grandchildren, and one great-granddaughter.

Carl Simpkins (thoracic surgery) of Columbia, Tenn., on May 27, 2011. He was 89. He served in the Navy in WWII and in the Vietnam War. Following his retirement from the Navy, he served as medical director for Springs Industries in South Carolina. He is survived by his wife, Dorothy, four children, and two grandchildren.

Lawton Smith (ophthalmology) of Miami, on Jan. 10, 2011. He was 81. He was one of the founders of the Bascom Palmer Eye Institute at the University of Miami Health System, where he worked from 1962 to 1993. In 1978, he launched the *Journal of Clinical Neuro-Ophthalmology*. He is survived by his wife, three children, and three grandchildren.

William Spearman (radiology) of Smyrna, Ga., on Sept. 4, 2011. He was 74. He and 10 other internal medicine doctors established the Colony Medical Group at Colony Square in Atlanta. Emory eventually bought the practice, and Spearman finished his career at The Emory Clinic on Clifton Road. He is survived by his wife, Francesca, two children, and three grandchildren.

William Spruell Jr. (rheumatology) of Lilburn, Ga., on Nov. 2, 2011. Twice a year, he traveled to Honduras to treat low-income residents. He is survived by his wife, Nancy, and five children.

Ildefonso Tellez (internal medicine) of Atlanta, on Sept. 14, 2011. He was 49. He is survived by his wife, Lourdes, his mother, and three sisters.

Halford Whitaker (pediatrics) of Lydia, Tenn., on Nov. 1, 2011. He was 77.

Milton Whitley (general surgery) of Huntsville, Ala., on June 18, 2011. He was 87. He was preceded in death by his wife,

James Forbes 55C 59M

John Schellack

William Spruell Jr.

Deaths | alumni news

James Crutcher

Paul Fernhoff

John Griffin Jr. 53C 56M 63MR

Jane, and is survived by three children, eight grandchildren, and one great-grandchild.

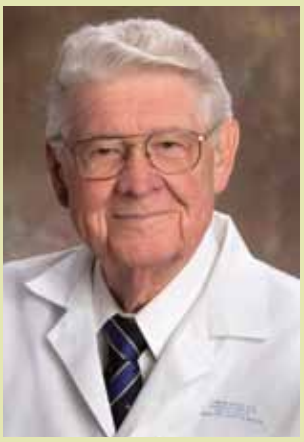
Ronald Wright (otolaryngology) of Oklahoma City, on Oct. 17, 2011. He was 67.

Faculty Deaths

John Ammons Jr., of Atlanta, on Aug. 20, 2011. He was 79. He was a neurologist at the Atlanta VA Medical Center from 1965 to 1995 and became an associate professor of neurology at Emory in 1969. After retiring as chief of neurology, he worked part-time in several specialized clinics. He was preceded in death by a son and is survived by his wife, Mary, a son, daughter, three stepchildren, and four grandchildren.

James Crutcher (internal medicine), of Powder Springs, Ga., on Oct. 11, 2011. He was an Emory professor of medicine, associate chief of medical services at the Atlanta VA Medical Center, national VA chief medical officer, and regional health director for Gwinnett and Rockdale counties. He was preceded in death by his wife, Frances, and is survived by two daughters and two sons.

Paul Fernhoff, of Atlanta, on Sept. 19, 2011. He was 65. He served as an associate professor of human genetics and pediatrics and as medical director of human genetics at Emory University Hospital. He served as



Willis Hurst, of Atlanta, on Oct. 1, 2011. He was 90. He was a nationally renowned cardiologist at Emory for 56 years who continued teaching well into his 80s. He was an author who co-edited the seminal cardiology textbook, *The Heart*. He also was well known as President Lyndon B. Johnson's personal cardiologist. He joined the Emory faculty in 1950 as one of two cardiologists on staff, served as professor and chair of the Department of Medicine from 1957 to 1987, and was a "founding father" of The Emory Clinic, which was established in 1953.

He taught more than 5,000 medical students and 2,500 residents and fellows during his career and continued to teach and counsel residents and medical students well into his 80s. He received numerous awards for his work, including the highest teaching awards from the American College of Cardiologists and the American College of Physicians. The Department of Medicine's residency program was named in his honor in 2003.

In 2004, *Emory Medicine* asked him to write a brief history of cardiology at the School of Medicine. He turned in a 26-page manuscript. **To read the highlights, access http://tinyurl.com/emory-heart.**

He was preceded in death by his wife, Nelie, and is survived by three sons, including **John 67C 76MR**, a cardiologist, and grandson **Stuart 10M**, who is now a resident at Emory.

Ted Leigh 38M

Fray Marshall

medical director of the new genetic counseling training program and of the Lysosomal Storage Disease Center, directing clinical trials for lysosomal storage diseases that have led to effective control of many of these disorders. In addition, he served as medical director of the Atlanta Jewish Gene Screen program, an initiative which provides carrier screening and reproductive options for young Jewish adults, and as medical director of the Pediatric Program of Hospice Atlanta, one of the largest children's hospice programs in the country. He is survived by his wife, Deborah, a daughter, son, and a granddaughter.

John Griffin Jr. 53C 56M 63MR, of Stone Mountain, Ga., on Aug. 6, 2011. He was 79. He had a pediatric practice for three years before returning to Emory for a residency in adult and child psychiatry and then joined the faculty. In addition to his practice in Emory Healthcare, he served as medical director of the Emory Autism Center and established child psychiatry services in the Covington and Gainesville community mental health centers. He was board certified in pediatrics, adult psychiatry, child psychiatry, addiction medicine, and cognitive behavioral therapy. He helped develop the exam for the National Board of Medical Examiners for the American Society of Addiction Medicine. He retired from Emory as professor emeritus at age 75 after 40 years of service and 20 years of service to the medical school's admission committee.

He is survived by his wife, Lavinia, two sons, and four grandchildren.

Ted Leigh 38M, of Atlanta, on Sept. 28, 2011, of congestive heart failure. He was 99. He was director of radiology at Emory University Hospital from 1948 to 1973 and radiology residency program director from 1973 to 1980, when he retired as professor emeritus. He continued to work one day a week at Grady Hospital until 1999.

He served in WWII, during which his superior said, "Leigh likes photography, and that's all an X-ray is, so make him the X-ray man." After the war, he completed a radiology residency.

He was chair of the radiology section of the American Medical Association and the Southern Medical Association. He was vice president of the American College of Radiology and the Radiological Society of North America. In 1975 he was elected president of the American Roentgen Ray Society (ARRS). The ARRS awarded him in 1990 the gold medal for distinguished service to radiology.

He was preceded in death by his wife, Patricia, and is survived by a son, daughter, and five grandchildren.

Fray Marshall, of Atlanta, Ga., on Dec. 2, 2011, of cancer. He was 67. He was chair of Emory's Department of Urology and the Ada Lee and Pete Correll Professor of Urology. He served Emory for 13 years and before Emory, Johns Hopkins for 23 years. At Johns Hopkins, he became the first Bernard Schwartz Distinguished Professor of Urology and Oncology, the director of the Division of Adult Urology, and chief of urology at Baltimore City Hospitals.

In 1984, he devised a new surgical treatment for intracaval neoplastic extension in the right atrium for patients with kidney cancer. Two years later, he held a patent for an extracorporeal shock wave lithotripsy and ultrasonographic stone localization. In 1991, he developed the Marshall Omni-Tract Mini-Lap Retractor Blade that he used in a "mini laparoscopic prostatectomy" that required a smaller incision, resulting in less post-procedure pain for patients. In 1997, he worked with researchers at Johns Hopkins to help develop the first ex-vivo gene therapy treatment for kidney and prostate cancer.

Last year, the medical school established the Fray F. Marshall Chair in Urology. Proceeds of the endowed chair will be devoted to research within the urology department. The designation recognizes Marshall for his many achievements at the helm of the department, developing a division of surgery when he first came to Emory in 1998 into an internationally known urology department by the

time he stepped down as chair in 2010 due to cancer.

He co-authored more than 300 scientific papers and 62 book chapters. He served on the editorial boards of the *Journal of Urology*, *Urology*, *Uro-oncology*, and the *International Journal of Urology*. His honors include the 2000 Distinguished Contributor Award from the American Urological Association and being named the first exchange professor of the International European American Urological Association. He also served as a trustee and vice president of the American Board of Urology.

He is survived by his wife, Lindsay, two children, and a grandson.

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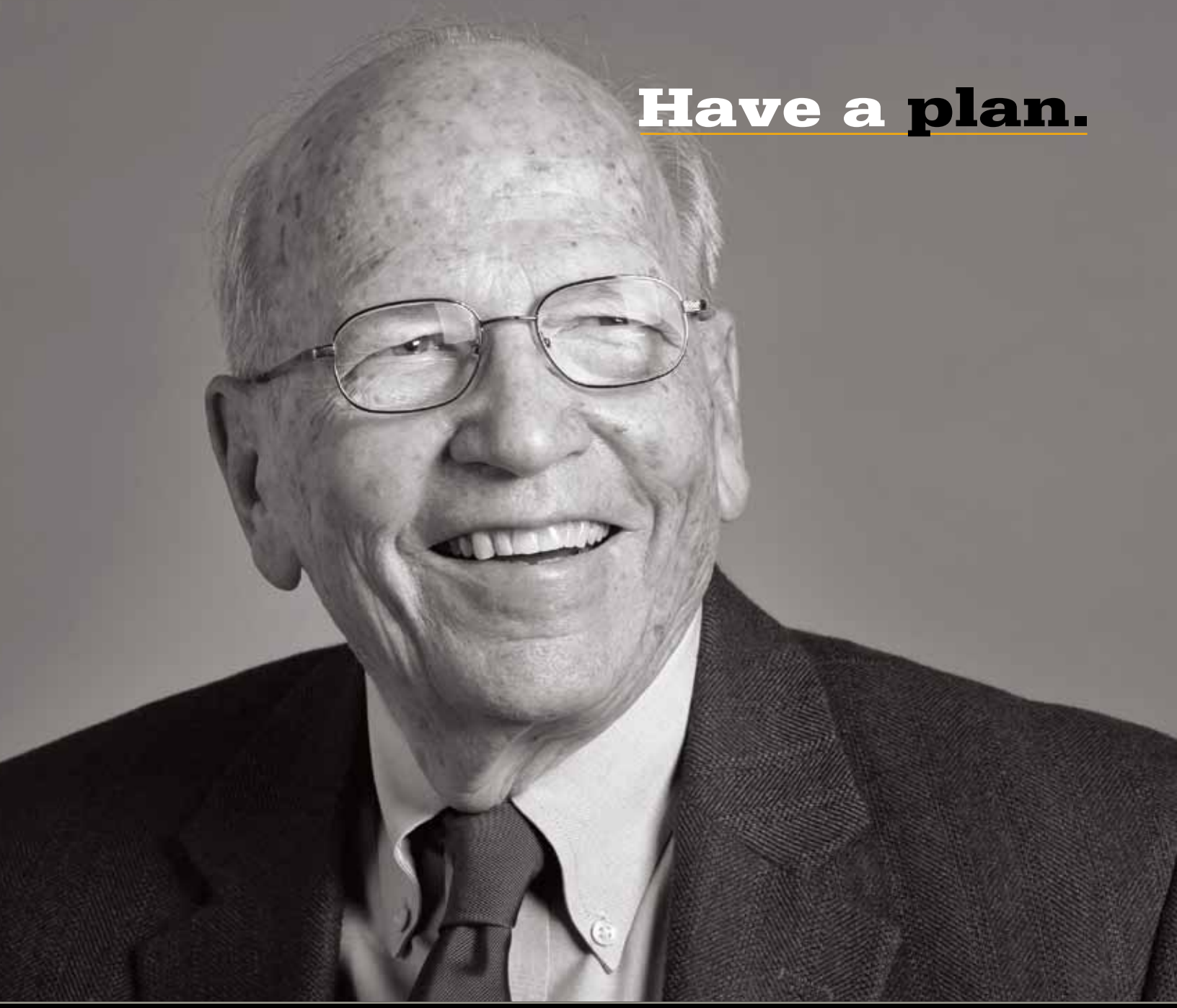

Have a plan.

DAN DUNAWAY was one of 62 applicants admitted to the Emory School of Medicine class of 1961. Nearly 1,200 others were not. “It’s a sobering thought that you were selected to be of service to the community when so many others weren’t,” says Dunaway 61M 62MR, a successful Memphis dermatologist who still practices at age 81.

Determined to assist future generations of medical students, he has funded charitable gift annuities and made a bequest to support the Class of 1961 Medical Scholarship Fund he helped establish. “What are we going to do? Say thank you and move on, or watch out for the next generation of students coming along?” he says.

Learn how you can make a difference by including Emory in your estate plans. Please call the Office of Gift Planning at 404.727.8875 or visit www.emory.edu/giftplanning.

Plan to be of service.

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Oncology researcher Lawrence Boise is looking at ways to block the survival of some plasma cells left over after the drug bortezomib has attacked multiple myeloma cells. He and oncologist Sagar Lonial have a research program that goes from bench to bedside back to the bench. 12