

MEMPHIS

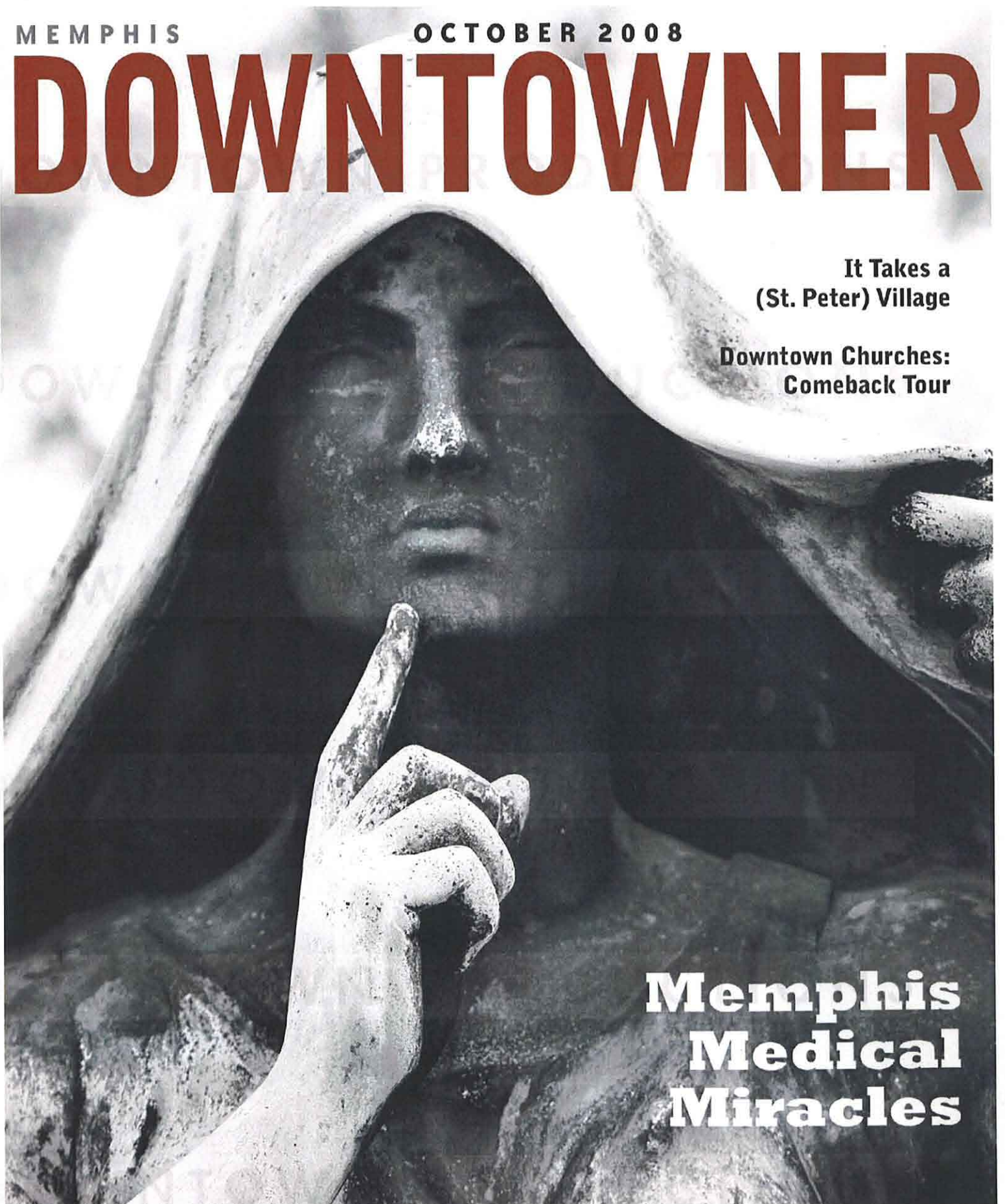
OCTOBER 2008

# DOWNTOWNER

It Takes a  
(St. Peter) Village

Downtown Churches:  
Comeback Tour

**Memphis  
Medical  
Miracles**



With its headquarters in Memphis's biotech district, Luminetx Corp. made waves in 2004 with its creation of the VeinViewer Imaging System. Those hard-to-find blood vessels zigzagging through the network of our circulatory systems became easy to quickly spot for immediate access to life-saving

injections. And as incredible as this invention is, Luminetx is hardly alone in Memphis medical innovation. The inventions created by Memphians have made dramatic impacts felt around the world in treating the sick and injured.

Here are just a few ...

# Medical Miracles

by Devin Greaney and Terre Gorham

## Fast Pellets



Tiny pellets represent life-saving innovation created by University of Memphis research professors Dr. Joel Bumgardner and Dr. Warren Haggard. The pellets, which contain an antibiotic, are applied directly to the wound, where they do their work accelerating the healing process — then disappear within 24 hours.

The work of two University of Memphis research professors is enough to have even an orange-blooded University of Tennessee fan cheer for these Tigers.

About three years ago, Dr. Warren Haggard, professor in the biomedical engineering department, was at an American Academy of Orthopedic Surgeons meeting. There, he heard of the Orthopedic Trauma Research Program initiated by the Department of Defense. One item on the agenda was a grant program offered for research to discover a way to reduce infections from combat-inflicted wounds. He applied for and received a grant. Shortly afterward, he and fellow professor Dr. Joel Bumgardner went to work.

**The idea sounded simple enough: release antiseptic directly at the wound site.**

Germs have long been a killer in warfare, but research in recent years shows further evidence of the critical importance of treating the silent killer. A 1993 battle in Somalia

## Medical Miracles

brought home that need. "In the *Black Hawk Down* battle, researchers followed the progress of the troops," Haggard says. "They found that about 25 percent of those soldiers' wounds became infected because of a delay in treatment. They also found that if a wound became infected, it added about six weeks to recovery time."

"If you're caught in a battle and get wounded by an IED or other high-energy weapon, you have a very large wound with a lot of tissue gone," says Bumgardner. "One problem is that you lose some of your body's ability to fight infections. Your skin is gone, which is a very effective barrier against infections. Your blood and vascular system is also damaged, so you can't get your body's wound-healing cells to the site to fight infection and initiate the healing process. This creates a very nice site for germs to set up household."

The idea sounded simple enough: release antiseptic directly at the wound site. "We started playing around with the chemistry of calcium sulfate to try to get it to degrade in a quick way," Haggard says. The plaster of paris-like compound already had many other medical uses, but this application would be entirely different. "We wanted something that could be applied to the wound, would release a therapeutic agent like an antibiotic, kill the bugs, and quickly degrade."

With the help of research associate Kelly Richelsoph and graduate student Stephanie Jackson, the scientists created pellets about 4 to 5 millimeters in diameter that contained the antibiotic amikacin. Now in the testing phase, so far so good.

"The military is very interested," Haggard says. "They have done pre-clinical studies simulating an injury. They placed bacteria in

the wound, but the bacteria had a special gene that made them luminescent so the scientists could easily see where the bacteria were. They surgically treated and rinsed out all of the wounds like they normally do. But to some wounds, they added the calcium sulfate pellets with antibiotic in the wound. Within 24 hours, the pellets were gone, and at 48 hours, the wounds had 1,000 times fewer bacteria in comparison to the wounds that were just surgically treated and washed out."

Battlefields are not the only places where such an application could save lives, of course. "You can take this approach domestically," Haggard says. "In the hospital, we have resistant organisms that take up residence. We are hoping we can use this approach there, too."

University of Memphis, 678-3733,  
[memphis.edu/research](http://memphis.edu/research).

## Sam Splint



The most well-known resident of 1408 Rayner Street in Memphis was George "Machine Gun Kelly" Barnes, who was captured there in 1933. But perhaps it should be better known as the childhood home of Dr. Sam Scheinberg. Never heard of him? He just might have helped you.

As an Army medic in Vietnam from 1968 to 1969, he saw the need for a better splint for broken bones. One case that sticks in his mind involved a soldier who arrived via helicopter for treatment. "He had a burn and a broken arm," Scheinberg remembers. "They had put a plastic inflatable splint on his arm. As the altitude changed, his hand went numb, and I had to take the splint off. It took the skin off his arm, too. It made me sick to my stomach, and the feeling comes back even now."

A splint is a simple device used to stabilize bone fractures and breaks while preventing further injury. It requires something that maintains its shape in order to hold a broken bone in place and keep the broken pieces from moving within the limb. The difficulty is that bones come in different sizes and shapes.

Around 1971, Dr. Scheinberg experienced his Aha! moment. While watching TV after 24 hours of surgery, he began to mindlessly bend an aluminum gum wrapper around his little finger. When the wrapper became firm and supportive, Scheinberg realized this concept

The first new prototype was created in their kitchen and packaged in an Oreo cookie wrapper.

could be used to create a splint in the same way bending a piece of paper just right can make a dustpan for sweeping.

In 1976 at the American Academy of Orthopedic Surgeons, Scheinberg presented his idea for a splint that could be used on almost any injured part of the body. The following year, he patented a thin strip of aluminum sandwiched between two layers of closed-cell foam as the Sam Splint. The mechanics has to do with the physics of curved surfaces: A flat thin sheet of soft metal is flimsy and weak, but when curved in cross-section, that same structure becomes amazingly rigid and strong.

Scheinberg, busy with his orthopedic practice, set the idea aside until 1984 when his wife, Cherrie, literally chased him around their house until he agreed to finish what he started. Scheinberg describes it as the luckiest 10 minutes of nagging in his life. The first new prototype was created in their kitchen and packaged in an Oreo cookie wrapper.

Twenty-three years and many millions of splints later, the Sam Splint has become the standard for hospitals, athletic trainers, outdoorsmen, paramedics, safety engineers, and militaries around the world. "We sell almost everywhere on the planet," Scheinberg says from his ranch on the Oregon coast. And sales go beyond the planet, too. NASA has even used the device on the Space Shuttle.

By the way, don't bother looking for Machine Gun Kelly's buried loot at Scheinberg's former home on Rayner. Sam and his friends already checked.

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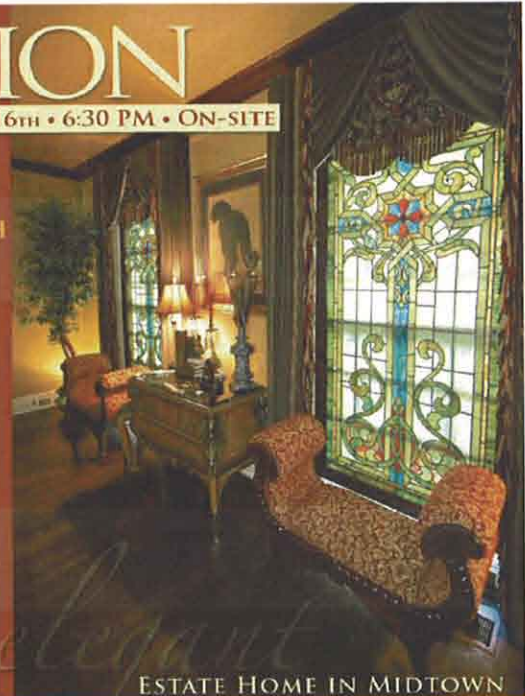
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