

# Texas Heart Institute Establishes Center to Coordinate Stem Cell Research

## **Congestive heart failure**

(CHF) is the foremost cardiovascular problem in the world, relentlessly defying all medical and surgical attempts at a cure. Stem cell therapy, which is based on the revolutionary notion that the myocardium can regenerate itself, has emerged as a promising new treatment option.

In theory, stem cell therapy is simple to apply, and it does not require immunosuppressive agents. Over the last several years, researchers at the Texas Heart Institute at St. Luke's Episcopal Hospital have been studying stem cell therapy in patients with coronary artery disease and CHF. Physicians of the Texas Heart Institute (THI) at St. Luke's have also been conducting laboratory studies with collaborators at The University of Texas M. D. Anderson Cancer Center in Houston to identify the best stem cell types for use in these patients.

The amount and scope of this research has grown quickly over the last five years, and THI at St. Luke's recently established a center to coordinate its stem cell research efforts. The center is funded in part by an anonymous \$2.5 million donation, and more funds are being sought from the National Institutes of Health.

The center is directed by James T. Willerson, MD, medical director and director of Cardiology Research, and Emerson C. Perin, MD, PhD, director of New Interventional Cardiovascular

Technology. It occupies more than 5,000 square feet on the 10th floor of the Texas Heart Institute at St. Luke's Episcopal Hospital – The Denton A. Cooley Building. Approximately 4,000 square feet of that space will house a heart failure laboratory; laboratories for biochemistry and molecular biology, cardiac electrophysiology, and cardiac physiology research; and stem cell storage facilities. The rest will serve as offices for support staff. The center's staff will also have access to THI's existing cardiovascular surgical and pathology research laboratories.

"The main goal of our combined research is to demonstrate that stem cells can save the lives of patients with heart failure by regenerating and restoring damaged cardiac cells and tissue," says Dr. Willerson. "Coordinating our research through the new stem cell center

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*—James T. Willerson, MD*

*Director, Cardiology Research*

should help us move this therapy more quickly to the patient's bedside."

Several projects under the center's auspices are already underway. Last year, THI at St. Luke's began the only FDA-approved trial in the United States which uses stem cells derived from the patient's own bone marrow that are injected directly into damaged heart muscle with a special catheter for the treatment of patients with severe CHF. The protocol is essentially the same as one Dr. Willerson and Dr. Perin used successfully in 14 Brazilian patients in collaboration with Brazilian colleagues. Twenty-two patients have been enrolled in the trial at THI at St. Luke's so far and additional stem cell trials are planned for this year.

The basic research collaboration with M. D. Anderson Cancer Center, including the cancer center's chief of Cardiology, Edward T.H. Yeh, MD, has revealed that circulating human CD34+ cells injected intravenously into the tail veins of immunodeficient mice differentiate into vascular and smooth muscle cells and fuse with existing and damaged cardiomyo-

Emerson Perin, MD, PhD, delivers stem cell treatment in the cath lab using a special catheter.

cytes. After an experimentally induced heart attack, they may even become new myocytes.

"In the laboratory, we will compare the stem cells we use now with other types of stem cells derived from placenta, cord blood, mesenchyma, and adipose tissue, and we will identify the optimal dosage," says Dr. Perin. "We'll also develop imaging procedures for tracking the movement, engraftment, and differentiation of injected stem cells over the long term."

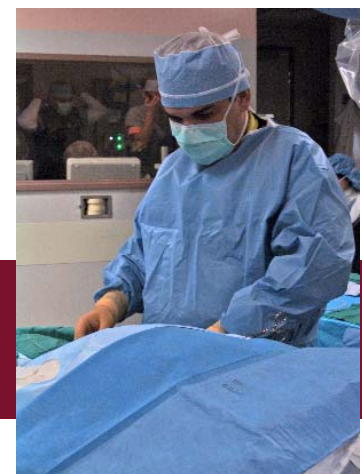
"Clinically," he adds, "we plan to eventually extend treatment to patients who have had acute myocardial infarctions not amenable to revascularization procedures, as well as to transplant candidates with ischemic or non-ischemic cardiomyopathies, including those being supported with left ventricular assist devices."

"The stem cell center will allow us to build quickly and effectively upon our previous efforts to apply stem cells therapeutically in humans with severe heart disease," says Dr. Willerson. ●

## **For more information:** Stem Cell Center

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