



**THE UNIVERSITY of TEXAS**

**HEALTH SCIENCE CENTER AT HOUSTON**

Office of Technology Management

## **THERMOGRAPHIC DETECTION AND TREATMENT OF ATHEROSCLEROTIC PLAQUES**

**Market:** Atherosclerotic coronary artery disease is the leading cause of death in industrialized countries. According to the American Heart Association, about 7,900,000 patients in 2004 had heart attacks, with 6,363,000 of them receiving inpatient cardiovascular operations and procedures. For 2007, the estimated direct and indirect cost of cardiovascular diseases in the United States is \$431.8 billion.

**Competitors and Current Problems:** Typically, patients who die of coronary disease may exhibit up to several dozen atherosclerotic plaques, or thickened areas in the wall of an artery; however, in most instances of myocardial infarction, cardiac arrest, or stroke, it is found that only one of these potential obstructions has, in fact, ruptured, fissured, or ulcerated. This rupture causes a large thrombus to form on the inside of the artery, ultimately occluding blood flow and injuring the heart or brain. A major prognostic and diagnostic dilemma for the cardiologist is how to predict which plaque is about to rupture and treat beforehand.

**The Technology:** Researchers at the University of Texas Health Science Center at Houston (UTHSC-H) and the Texas Heart Institute have developed and have available for license a portfolio of devices, methods and applications using infrared, heat-sensing and other optical signal detection in catheters and stents to identify potentially fatal arterial plaques in patients with diseased arteries. The infrared systems allow for detection of locally inflamed, heat-producing, atherosclerotic plaques, which are at greater risk for rupture, fissure, or ulceration, and consequent thrombosis and occlusion of the artery. The devices and methods may be used to detect abscesses, infection, and cancerous regions by the heat such regions display in relation to the temperature of immediately adjacent tissue. Additionally, regions of cooler than ambient tissue may be detected in a vessel or organ, which can indicate cell death, thrombosis, cell death, hemorrhage, calcium or cholesterol accumulations, or foreign materials. The technology allows for direct imaging and treatment of vessel walls, a fundamental advantage over other diagnostics, including angiography.

### **NON-CONFIDENTIAL TECHNOLOGY DESCRIPTION**

The preceding is intended to be a non-confidential summary of a novel technology created at the University of Texas Health Science center at Houston (UTHSC-H), for which the University has obtained patent protection.

**UTHSC-H Ref. No.:** 1993-0001, 1998-0012, 1999-0003, 1996-0009

**Inventors:** Casscells, Willerson, Naghavi, et.al.

**Patent Status:** United States Issued Patent Nos. 5,935,075; 5,906,636; 6,475,159;  
6,615,071; 6,451,044; 6,763,261; 6,993,382; 7,123,968.

Pending United States Application Nos. 11/273,683; 10/640,570.

**License Available:** world-wide; exclusive or non-exclusive

To obtain further information about this technology, please contact:  
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