

# Heart patch pulses like the real thing

Dec 15 (Reuters) - Pulsing transplanted heart cells with electrical current helps them grow into mature cardiac cells, bringing doctors closer to a grow-your-own heart patch, U.S. researchers said. So far tests have only been done in rats but the researchers at the Massachusetts Institute of Technology and Harvard University say they hope to find a way to repair tissue damaged when people have a heart attack. We have been trying to engineer a patch of tissue that has the same properties as native heart tissue, or myocardium, that could be attached over injured myocardium," said Gordana Vunjak-Novakovic of both Harvard and MIT, who led the study. Think of it as a patch for a broken heart," she added in a statement. Vunjak-Novakovic and her colleagues have been working for years to find ways to make tissue patches for hearts, new blood vessels and other organs. Simply transplanting cells does not work, because they do not grow into the right layers and often do not produce the compounds that cells native to organs do. The researchers have found that by growing cells under conditions that mimic the living human body, they can make them behave more like the normal tissue.

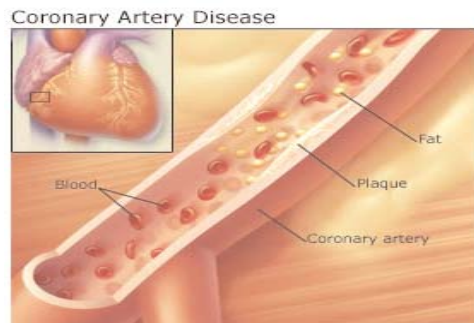
After growing the rat heart cells for a week with regular electrical pulses coursing through the lab dish, the cells started to look and pulse like mature heart cells. They also produced heart proteins, such as the myosin heavy chain and cardiac troponin I, essential for normal heart function. "The real advance here is we mimicked what the body does itself and got it to work," said Robert Langer, who also worked on the study. One key goal is to get the cells to contract in a synchronized way. "We don't want them beating at different rates," said researcher Hyounghsin Park. The eventual goal is to take a few cells from a heart attack patient, grow them in the lab under the right conditions and then transplant them back to the injured area.

Publish Date: December 15, 2004

# MRI used to measure heart attack

Dec 23 (HeartCenterOnline) - Researchers at Johns Hopkins have developed a way to use magnetic resonance imaging (MRI) in measuring heart attacks in animal studies. If the method works in people, it would be a major advance in the treatment of heart attack. Currently, there are several ways to estimate the damage caused by a heart attack, but they are notoriously subjective and often overstate the extent of the damage, often by as much as 10 percent. The new MRI method, however, was found to be 94 percent accurate when its results were compared against precise autopsy results. The extent of a heart attack influences how aggressively physicians will treat the patient. It is also a valuable tool to help physician predict a patient's future risk profile. "Indeed, a person who has suffered damage to more than 30 percent of the left ventricle of the heart is twice as likely to die within

a year from the injury as someone who has suffered less damage, and bigger [heart attacks] often require more aggressive drug therapy or, in the most severe cases, surgery to repair heart tissue or prevent further damage," according to senior study author and cardiologist Joao Lima, M.D., associated professor of medicine and radiology at The Johns Hopkins University School of Medicine.



According to the American Heart Association, there were more than 560,000 new heart attacks in 2001, with another 300,000 recurrent heart attacks.

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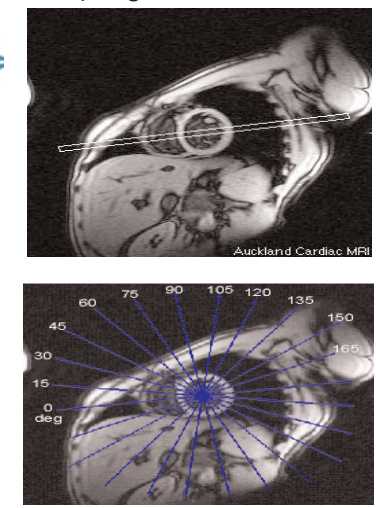
Please fax your referrals to  
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## What is a Cardiac MRI?

MRI (magnetic resonance imaging) uses radio waves and a strong magnetic field rather than x-rays to provide remarkably clear and detailed pictures of internal organs and tissues. The procedure is valuable in diagnosing a broad range of conditions in all parts of the body, including heart and vascular disease, stroke, cancer, and joint and musculoskeletal disorders. MRI is unique in that it can also create detailed images of blood vessels without the use of contrast material (although there is a trend toward the use of special non-iodinated MRI-contrast material, for example, Gadolinium). MRI requires specialized equipment and expertise and allows evaluation of some body structures that may not be as visible with other imaging methods. If you have questions regarding the MRI procedure call mmpc Cardiovascular Services at 616-974-4567.



## Cardiovascular Welcomes New Staff

### Jessica Bales, Exercise Physiologist

Jessica is an Exercise Physiologist that acquired a bachelor of science degree in Health Fitness in preventative and rehabilitation with a double minor in nutrition and psychology from Central Michigan University. She completed an internship at Spectrum Health Preventative Cardiology and Rehabilitation. Jessica will also be at the Holland office two days a week.



### Janet MacDonald, Certified Cardiovascular Technologist

Janet is our new full time Echo Sonographer, from Carnegie Institute in Troy MI, where she completed her certification of cardiovascular technologist/echocardiography program in March 2004. She was also a medical assistant for 5 years at William Beaumont Hospital.



### Rachel Riggs, Medical Assistant, Referral Specialist

Rachel is our new scheduler in the office. She has worked in both clinical and clerical areas in both the hospital and physician office setting. Rachel is back in school continuing her education in ICD-9 and CPT coding.



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# Calcification

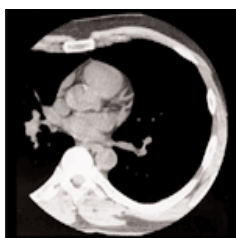
(Arterial Calcification, Coronary Calcification, Calcium Deposits)

Calcification is a process in which arterial plaque grows progressively harder and more brittle. It occurs when calcium deposits in the blood attach to cholesterol deposits on the walls of arteries, forming a hard and brittle covering over plaque formations. Calcification may also occur around the heart's four valves, narrowing the valve and leading to conditions such as calcific aortic valve stenosis.

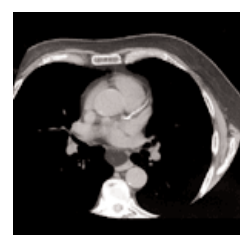
New tests that measure the amount of calcium in plaque may help diagnose heart disease and the risk for stroke, even when a patient shows no outward symptoms. These new tests are noninvasive, relatively inexpensive and take only about 15 minutes.

Critics of the new tests point out that not all plaque is calcified, and not all calcification is a sign of narrowed arteries. An elevated calcium score may be a helpful indicator that other testing is necessary, but most physicians do not rely solely on these tests for diagnosis. The nuclear stress test and cardiac catheterization (which includes a coronary angiogram) remain the gold standards for assessing the presence and severity of heart disease. If you would like more information contact mmpc Cardiovascular Services at 616-974-4567.

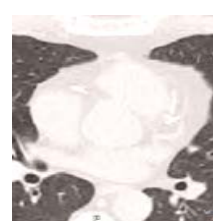
## Scan Images: Three Grades of Calcium Plaque Burden



No Visible Calcium  
No identifiable plaque



Moderate  
Moderate plaque



High  
Extensive plaque

## Echocardiogram Coming Soon to Holland

We are very pleased to announce that beginning in March, our cardiovascular testing will include echocardiogram study at the Waverly office in Holland. 2D Echo will be available on Thursdays. For more information call the mmpc Waverly office at 616-796-6500.

# Researchers identify new treatment for atherosclerosis

Dec 17 (HeartCenterOnline) - Researchers at the University of California, San Diego, have uncovered a new possible role for drugs that are used to reduce fatty triglyceride levels and improve insulin resistance in the liver.

The drugs apparently also prevent the accumulation of cholesterol in arterial lesions by up to 70 percent. These lesions are caused by atherosclerosis, a disease that gradually causes the arteries to stiffen and become blocked with deposits of plaque. Cholesterol is an important part of the atherosclerotic process because it accumulates in the lesions, causing them to swell in size.

If atherosclerosis occurs in the coronary arteries, it may cause a heart

attack by completely blocking the flow of blood, or when pieces of plaque rupture and travel through the bloodstream.

The drugs work by activating proteins called peroxisome proliferators-activated receptors (PPARs). These proteins are active in the arterial wall and help prevent cholesterol from building up.

"While current preventative therapy for cardiovascular disease is primarily based on reducing global risk factors such as hypertension, cholesterol levels and smoking, these findings provide a potential new strategy for the prevention and treatment of atherosclerosis," said the study's co-senior author, Christopher Glass, M.D., Ph.D., professor of cellular and molecular medicine at the University of California.

The study's authors identified several sub-types of PPARs in their study. Each of these acts somewhat differently within the artery, so there is the possibility that one or more PPAR drugs may be isolated and used in combination with other drugs to reduce the risk of atherosclerosis.

The study's findings also have important implications for patients with diabetes, which is a major risk factor for developing atherosclerosis. By treating diabetics with drugs that activate specific PPARs, physicians may be able to reduce the number of cardiovascular incidents that occur. The study was published in the December issue of the Journal of Clinical Investigation.

# Eating breakfast cuts calories and heart risk

## Skipping breakfast may lead to weight gain and heart disease

Feb. 11, 2005 -- Skipping breakfast may put you on the fast track to weight gain and heart disease, according to a new study.

Researchers found that healthy women who skipped breakfast for two weeks ate more during the rest of the day, developed higher "bad" LDL cholesterol levels, and were less sensitive to insulin than women who ate breakfast every day. High LDL cholesterol levels and impaired insulin sensitivity are both major risk factors for heart disease.

Although previous studies on the effects of eating or skipping breakfast in obese people may have produced conflicting results, researchers say the findings of this study show that skipping breakfast may lead to weight gain as well as increase the risk of heart disease in healthy people over time.

Researchers say skipping breakfast has become more common among adults in recent years, perhaps due to efforts to lose weight or time pressures in the morning. But at the same time, the prevalence of obesity and overweight has also dramatically increased.

Eat Breakfast, Eat Less Later, in the

study, which appears in the February issue of the American Journal of Clinical Nutrition, researchers examined the effects of eating or skipping breakfast on calories eaten and burned throughout the day as well as circulating insulin, glucose, and cholesterol levels in 10 healthy women of normal weight.

For two weeks, the women ate a breakfast consisting of a bowl of whole-grain cereal (Bran Flakes from Kellogg's) with 2% milk between 7:00 a.m. and 8:00 a.m. and then had a midmorning snack of a candy bar (Kit Kat from Nestle) between 10:30 a.m. and 11:00 a.m. The women then ate two additional meals and snacks at predetermined times every day and kept records of what they ate. After a two-week break, the same women then followed the same protocol but skipped the early morning meal and had the cereal at lunch time (between noon and 12:30 p.m.). They then ate the other two meals and snacks at the predetermined times for another two weeks.

The results showed that when the women ate breakfast, they ate about 100 fewer calories per day (an average of 1,665 calories per day vs. 1,756 calories per day over a three-day measurement period).

Researchers also found that total and LDL "bad" cholesterol levels were significantly lower in the women who ate breakfast. Total cholesterol was 121 mg/dL in the breakfast group compared with 133 in the other group. LDL was 60 in the breakfast group and 70 in the non-breakfast group. The women who ate breakfast also had a better insulin response to eating, suggesting that their risk of diabetes was lower. The women's body weight didn't change significantly between the two groups during these two-week periods, but researchers say the results offer a potential mechanism by which skipping breakfast could lead to weight gain in the longer term. In addition, the results show that the negative effects of skipping breakfast on cholesterol and insulin levels may also increase the women's risk of heart disease over time.

For more information contact mmpc Cardiovascular Services at 616-974-4567. If you would like more information about weight management contact mmpc Center for Health Excellence at 616-974-4400.

SOURCE: Farshchi, H. American Journal of Clinical Nutrition, February 2005; vol 81: 388-396.

# Blood protein predicts heart attack risk

Dec 30 (HeartCenterOnline) - Elevated levels of a blood protein called mannose-binding lectin (MBL) have been tied with a decreased risk of heart attack, especially among diabetics.

The new findings may help physicians better identify people at risk of heart attack and design therapy to help prevent it. The study was published in The Journal of Experimental Medicine. MBL is a protein that circulates in the blood and plays an

important role in the body's autoimmune reaction by binding to pathogens and preparing them for destruction by white blood cells. The level of MBL in the blood is genetically determined and may vary dramatically from person to person.

Although the role of MBL isn't completely understood, researchers speculated that the protein lowers heart attack risk by binding to the oxidized form of cholesterol and helping to remove it from the blood-

stream. Oxidized cholesterol is abundant in diabetics. This may explain why high levels of MBL are particularly important among diabetics.

If you would like more information call mmpc Cardiovascular Services at 616-974-4567.

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