

# The Stem Cell Research Report

Current News About  
Adult, Embryonic,  
and Cord Blood Stem  
Cell Research

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## Diabetes Patients Insulin-Free Following Blood Stem Cell Treatment

A treatment using blood stem cells allowed several newly diagnosed Type 1 diabetes patients to be insulin-free for extended periods of time. Type 1 diabetes mellitus occurs when pancreatic beta cells come under autoimmune attack. At the time of the diagnosis, the 15 patients in the study had approximately 60 to 80 percent of their pancreatic beta cell mass destroyed.

A team of researchers from the University of Sao Paulo, Brazil and from the Northwestern University Feinberg School of Medicine in Chicago conducted the study, in which high-dose immunosuppression was followed by AHST, a type of blood stem cell transplantation that uses stem cells from the patients' own blood. The stem cells are removed, treated, and returned to the patients by intravenous injection, according to an abstract of the research which appeared in the April 11 issue of the *Journal of the American Medical Association*.

Ninety-three percent of the patients—fourteen out of the fifteen—achieved various periods of time during which they were independent of insulin: one month, five months,

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## British Scientists Grow Human Heart Tissue from Adult Stem Cells

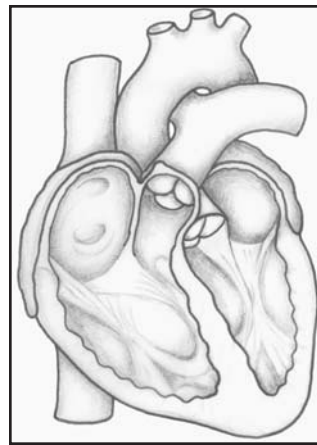
Using bone marrow adult stem cells, a team of British researchers have effectively grown human heart tissue. This research is promising: replacement human heart tissue could be made available within three to five years for thousands of people suffering from cardiovascular disease, if animal trials are successful.

The replacement tissue successfully operates as a valve. One lead researcher, Adrian Chester, said, "You have mediators in blood or released locally in the valve that can make parts of the valve contract and relax. That work has then extended into looking at the incidence of nerves in the valve—these can cause the types of contractions and relaxations in a very specific way."

Current treatments for cardiovascular disease, which are fraught with difficulties, rely on the use of artificial valves. However, Sir Magdi Yacoub, a Professor of Cardiac Surgery at Imperial College in London, whose team performed the research, said, "The way a living valve functions, it anticipates hemodynamic events and responds and changes its shape and

size. It's completely different from an artificial valve which will just open and shut. The heart muscle itself will appreciate something which will make it free to contract properly."

The treatment consisted of extracting stem cells from adult bone marrow and manipulating it to become heart valve cells, which then developed into tissue. The process takes a month with human tissue; however, if this research becomes available for use in human patients, tissue cultures could be pre-grown and made immediately ready for use. ■



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The Stem Cell Research Report  
P.O. Box 2994  
Annapolis, MD 21404  
410.269.6397

Send email to [info@stemcellresearchreport.com](mailto:info@stemcellresearchreport.com), or visit the web site at [www.stemcellresearchreport.com](http://www.stemcellresearchreport.com)

Publisher: *Angela Martin*  
Editor: *Robert Brown*  
Scientific Advisor: *David Prentice, Ph.D.*  
Contributors: *Robert Harlan*  
*Chad Zik*

# Muscle Stem Cells Used as New Treatment for Heart Disease

A recent study presented at the American College of Cardiology’s Innovation in Intervention demonstrated the use of a three-dimensional guided catheter system to deliver muscular stem cells to the heart.

This new treatment may make it possible for doctors to replace scarred heart tissue with healthy heart muscle using stem cells from a patient’s own skeletal muscle. Scar tissue often results in patients who experience a heart attack, which limits the ability of the heart to pump blood. There is currently no effective treatment to replace scar tissue in the heart with healthy tissue.

One of the major advantages of such a procedure is that the patient’s own stem cells are used. This assures that the cells are compatible with the patient’s body, avoiding the possibility of immune reactions that are common in tissue and organ transplants. Another advantage is that the procedure would be minimally invasive, using only a small incision to introduce the catheter, meaning that the recovery time of the patient would be minimized.

This was a Phase I clinical trial; it showed marked improvement in the treatment groups, while untreated patients showed either no improve-

ment or worsening of their condition. The success of the trial has led the FDA to sanction a Phase II involving up to 160 patients to investigate further the possibility of this treatment being used in the future. ■

## Diabetes Patients Treated with Adult Stem Cells

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seven patients for at least six months, four for at least 21 months, and one for almost three years. Moreover, there was no mortality, and severe side effects occurred in only three patients. ■

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