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Scientists achieve repair of injured heart muscle in lab tests of stem cells

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Researchers at Children's Hospital of Pittsburgh of UPMC have been able to effectively repair damaged heart muscle in an animal model using a novel population of stem cells they discovered that is derived from human skeletal muscle tissue.

The research team — led by Johnny Huard, PhD — transplanted stem cells purified from human muscle-derived blood vessels into the hearts of mice that had heart damage similar to that which would occur in people who had suffered a heart attack.

These transplanted myoendothelial cells repaired the injured muscle, stimulated the growth of new blood vessels in the heart and reduced scar tissue from the injury, thereby dramatically improving the function of the injured left ventricle, said Dr. Huard, director of the Stem Cell Research Center at Children's Hospital's John G. Rangos Sr. Research Center.

"This study confirms our belief that this novel population of stem cells discovered in our laboratory holds tremendous promise for the future of regenerative medicine. Specifically, myoendothelial cells show potential as a therapy for people who have suffered a myocardial infarction," said Dr. Huard, also the Henry J. Mankin Professor and vice chair for research in the Department of Orthopaedic Surgery, University of Pittsburgh School of Medicine. "The important benefit of our approach is that as a therapy, it would be an autologous transplant. This means that for a patient who suffers a heart attack, we would take a muscle biopsy

from his or her muscle, isolate and purify the myoendothelial cells, and re-inject them into the injured heart muscle, thereby avoiding any risk of rejection by introducing foreign cells."

Results of this study are published in the Dec. 2 issue of the *Journal of the American College of Cardiology*.

The myoendothelial cells used in this study were more effective at repairing the injured cardiac muscle and reducing scar tissue than previous approaches that have used muscle cells known as myoblasts, according to Dr. Huard. At six weeks after injection, the myoendothelial cell-injected hearts functioned at 40 to 50 percent more effectively compared with hearts that had been injected with myogenic cells (myoblasts).

Source: Children's Hospital of Pittsburgh