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New study finds knocking out p63 gene as means of converting scar tissue into muscle tissue in the heart

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Following a heart attack, the parts of the heart muscle that die do not regenerate into new heart tissue and instead are replaced by scar tissue. Using rodent models, researchers at Baylor College of Medicine are looking for a means to genetically convert this scar tissue into muscle tissue at the cellular level, which could ultimately be a way to treat heart attack and heart failure patients. Their latest work was published in The *Journal of Thoracic and Cardiovascular Surgery*.

"Nearly 5 million Americans can be expected to develop advanced congestive heart failure, and, currently, heart transplant or mechanical circulatory support implantation are the only options for patients with end-stage heart failure," said Dr. Todd Rosengart, chair and professor of the Michael E. DeBakey Department of Surgery at Baylor and senior author of the paper. "Our latest findings offer a promising new solution for treatment and improved cardiac function."

The goal of the study was to increase the plasticity of the heart scar cells, meaning their ability to take on characteristics of heart muscle cells.

Through gene transfer studies in the lab, Rosengart and a team of researchers discovered that a gene called p63 appears to repress the cell plasticity. When the researchers knocked out this gene, they found that cell reprogramming increased and some cells developed heart muscle cell characteristics. Under proper conditions, other cells started beating.

"This could potentially be a safe and effective strategy for inducing human cardiac cellular reprogramming as a potential therapeutic strategy for the treatment of heart failure," Rosengart said.

The next step in the research is to use this new strategy to improve heart function in animal models, which the researchers have already accomplished previously with other less potent reprogramming strategies.

More information: Vivekkumar Patel et al. p63 Silencing Induces Reprogramming of Cardiac Fibroblasts into Cardiomyocyte –Like Cells, *The Journal of Thoracic and Cardiovascular Surgery* (2018). DOI: 10.1016/j.jtcvs.2018.03.162

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