# AUTOLOGOUS CARDIAC STEM CELL THERAPY FOR HEART FAILURE

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## OTHER INFORMATION

### KEYWORDS

Autologous stem cell therapy

### CATEGORIZED AS

- Medical
  - Disease: Cardiovascular and Circulatory System
  - Stem Cell

### RELATED CASES

2013-028-0

## BACKGROUND

Over 5 million Americans currently suffer with congestive heart failure and despite aggressive medical therapies targeted to treat this disease; the outlook for these patients remains grim, with estimated mortalities of 33% and 50% at 1 and 5 years, respectively. Congestive heart failure (CHF) remains a significant unmet need in the global medical community. A treatment option for CHF by cellular transplantation of stem cells is a developing research area. This approach has been studied using fetal cardiomyocytes, adult skeletal muscle cells, autologous bone marrow-derived mesenchymal stem cells, cardiac progenitor (CP) cells, and cardiomyocytes derived from embryonic stem cells. However, current studies have yielded modest results in reducing infarct size and scar tissue. Furthermore, the necrotic/apoptotic loss of the vast majority of donor cells within days after transplantation is a major drawback.

## TECHNOLOGY DESCRIPTION

Investigators at the University of California, San Francisco have isolated and cultured a novel adult cardiac stem cell population which is derived from infarcted adult heart. The cell population is clonogenic and expresses markers of nascent cardiac muscle, endothelium, and vascular smooth muscle which have the potential to differentiate into both cardiomyocytes and vascular cells. The expression of a specific fetal cardiac progenitor cell marker is several-fold higher in the isolated cells when compared with the adult cardiac tissue. Mouse studies showed that this population transplanted in the infarcted heart survived 25 days in the microenvironment and improved cardiac function. The transplant resulted in reduced infarct size and enhanced endogenous angiogenesis in the injured heart. Since these cells are obtained from age-appropriate tissues of the infarcted heart it can be used to as an autologous therapy without the risk of immune rejection.

## APPLICATIONS

- Cardiac stem cell therapy for heart failure
- Autologous stem cell therapy

## ADVANTAGES

- Clonal cell population expressing fetal cardiac tissue markers.
- Ability to differentiate into all cardiac cell types.
- No risk of immune rejection.

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Issued Patent | 9,492,484 | 11/15/2016 | 2013-028 |

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