**Concurrent Injection of Biomaterial Improves Efficacy of TMR Therapy**

**Title:** Concurrent Injection of Biomaterial Improves Efficacy of TMR Therapy

**Invention:** This invention uses an extracellular matrix derived from the amniotic membrane that is injected with stem cells to increase vascularization of heart scar tissue after surgery with transmyocardial revascularization therapy.

**Background:** Advanced heart failure continues to be a prevalent cause of morbidity and mortality. Given the limited treatment options, the continued search for novel therapies has made the intrinsic regenerative properties of stem cells a proposed “bridge-to-regeneration” for myocardiocytes. Earlier versions of this therapy included needle-like arrays, which were used to puncture the myocardium, while more current conventional therapy includes the use of a CO2 laser to puncture the tissue. Both methods show little evidence of causing localized blood vessels. The invention presented here injects the myocardium with an extracellular matrix involving stem cells, which improves and/or restores cardiac function in scarred and hypertrophied hearts.

**Applications:**

- Treatment of patients with ventricular scarring
- Treatment of patients undergoing ventricular device assist implantations

**Advantages:**

- Combines TMR and allogenic human amniotic fluid-delivered stem cells
- Provides a treatment for scarred and hypertrophied hearts
- More effective than conventional approaches

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