

## Myocardial Infarction Stem Cell Treatment using Coacervated Stem Cell Carrier

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Myocardial infarction (MI) has resulted in the loss of cardiac muscle and left ventricular dysfunction, which needs exogenous stem cells delivery by cell injection, cell patch, and cell sheet. However, injecting cells is invasive to thinned myocardium with low delivery efficacy due to circulation with high blood pressure. Attaching cell patch or sheet on myocardium is not curative for inner endocardium due to epicardium thickness and scar. Thus, future methods aim the increasing cell retention. In the work, novel stem cell therapy was suggested by injectable sticky mussel adhesive protein (MAP)-based 3-dimensional stem cell carrier with water immiscibility. With high encapsulation efficiency and survival rate of encapsulated mesenchymal stem cells, the MAP-based cell carrier was well-injected and evenly distributed throughout scarred myocardium in vivo and fostered the integration between grafted stem cell carrier and damaged tissue, resulting in high stem cell retention and maximized paracrine effects, inducing angiogenesis in damaged myocardial tissue, prevented aggravation of myocardial wall, induced contractive force recovery, and prevented remodeling and scar formation.