Mesenchymal stem cells (MSCs) can regenerate tissue and treat many debilitating diseases, including cardiovascular disease. Human MSC, however, requires lengthy ex vivo expansion times to prepare a sufficient amount of cells. This reduces transfectability, while increasing costs and contamination risk. MSCs also have poor survivability and short lifespans, further limiting their use. A new mechanism using poly(lactic-co-glycolic acid) (PLGA) and poly(ethyleneimine) (PEI) porous particles to deliver MSCs increases the efficiency of MSC treatment. The polymer is optimized for MSC bonding affinity, and constructs an anchoring and supporting system for MSC-loading. The particles are loaded with MSCs and injected into the body to treat damaged tissues, specifically damage from myocardial infarction.


**TECHNOLOGY SUMMARY**

- Decreases cost of treatment through 75 percent reduction in MSCs.
- Reduces toxicity.
- Enhances binding affinity.
- Decreases treatment time without diminishing therapeutic efficiency.

**INVENTOR PROFILE**

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