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PLGA AND PEI BASED PARTICLES FOR DELIVERY OF MESENCHYMAL STEM CELLS

THERAPEUTICS

PLGA/PEI polymer based porous particles for effective delivery of mesenchymal stem cells.

TECHNOLOGY TYPE

Drug Delivery
Nanoparticles
Stem Cells

STAGE OF DEVELOPMENT

- Bench prototype developed.

- Ongoing in vivo animal testing.

IP PROTECTION

PCT Pending

PLGA/PEI Particles and
Methods of Making and Using
the Same
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TECHNOLOGY SUMMARY

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(ethylenimine) (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.

FEATURES AND BENEFITS

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

RECENT PUBLICATIONS

Lee, Y.S., Lim, K.S., Oh, J.E., Yoon, A.R., Joo, W.S., Kim, H.S., Yun, C.O., Kim, S.W. (2015). Development of porous PLGA/PEI 1.8k biodegradable microspheres for the delivery of mesenchymal stem cells (MSCs). *Journal of Controlled Release*. 205:128-133.
doi: 10.1016/j.jconrel.2015.01.004

INVENTOR PROFILE

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