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Self-Assembling Peptides for Cell and Notch-Ligand Delivery

Self-assembling peptides that form hydrogels comprising peptide sequences for the activation of signaling pathways

Researchers at Georgia Tech Research Corporation and Emory University have discovered self-assembling peptides that form hydrogels comprising peptide sequences for the activation of signaling pathways. The hydrogel polypeptide and the recombinant polypeptide are 1.5% to 2.5% by weight to volume of the hydrogel. The hydrogel is comprised of a stem cell, progenitor cell, cardiac stem cell, cardiac progenitor cell, bone marrow derived cell, or mesenchymal stem cell. The technology also includes methods of treating or preventing cardiovascular disease by administering an effective amount of a composition comprising cells to a subject in need. The composition is administered by injection into cardiac tissue or pericardium, or infusion into the circulatory system, or by implanting a hydrogel within or adjacent to cardiac tissue or cells.

Summary Bullets

- Hydrogels are biocompatible, easy to modify and biodegradable
- Could be applied in a more platform-like manner by incorporating other peptides to repair cardiac or other tissues
- The peptide sequence activates signaling of pathways improving the growth or replication of tissue or cells

Solution Advantages

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Potential Commercial Applications

- Treat diseases or conditions:
    - coronary heart disease
    - arteriosclerosis

    - ischemic heart disease
    - myocardial infarction
    - congestive heart failure

Background and More Information

Cardiovascular disease is a leading cause of mortality. There is a need for improvement of implanted cell retention in the infarcted heart. The market for hydrogel products is projected to reach $15.33 Billion by 2022, at a compound annual growth rate (CAGR) of 6.04% from 2017 to 2022. Data on the mechanical characterization of hydrogels using atomic Force Microscopy measurements of Young's modulus of hydrogels. The average Young's modulus of the 1% hydrogels (1R, 1 RS and 1RJ) is 500 Pa and the 2% hydrogels (2R, 2RS, 2RJ) is 1800 Pa.

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Publications

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