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TECHNOLOGY ABSTRACT

Novel Media Formulation to Prolong Viability of Osteochondral Tissues Intended for Osteochondral Allograft Transplantation

Reference No.: INV-2023008

Abstract:

Osteochondral allograft transplantation is a surgical technique used to treat large cartilage focal lesions. The transplantation process involves resection and replacement of degraded cartilage with osteochondral grafts (consisting of bone and cartilage) harvested from a cadaveric donor. Success is related to maintaining a minimum 70% chondrocyte (cartilage cell) viability within the donor tissue during the prolonged storage required for completion of routine screening tests prior to transplantation. One storage method used by Canadian tissue banks is Lactated Ringer's Solution supplemented with the antibiotics cefazolin and bacitracin, allowing for a maximum storage period of 14 days.

The present invention provides a novel medium formulation and method for preserving osteochondral tissues during long term storage. In rabbit studies, the medium formulation and method can maintain chondrocyte viability and metabolism at levels that potentially quadruples the time for fresh osteochondral transplantation in Canada.

Application(s):

- Osteochondral allograft transplantation
- Prolonged storage of osteochondral grafts
- Increased availability of transplants for clinical use
- In vitro growth and maintenance of chondrocytes

Advantages:

- Our media significantly extends the time when chondrocyte viability is maintained at levels acceptable for transplantation to 56 days and reduces apoptosis at the articular surface, which will increase chances of a successful allograft transplantation.

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- Use of this novel storage medium and method can potentially increase the clinical availability of donor tissues for surgical transplants, thereby increasing the numbers of patients receiving allografts.

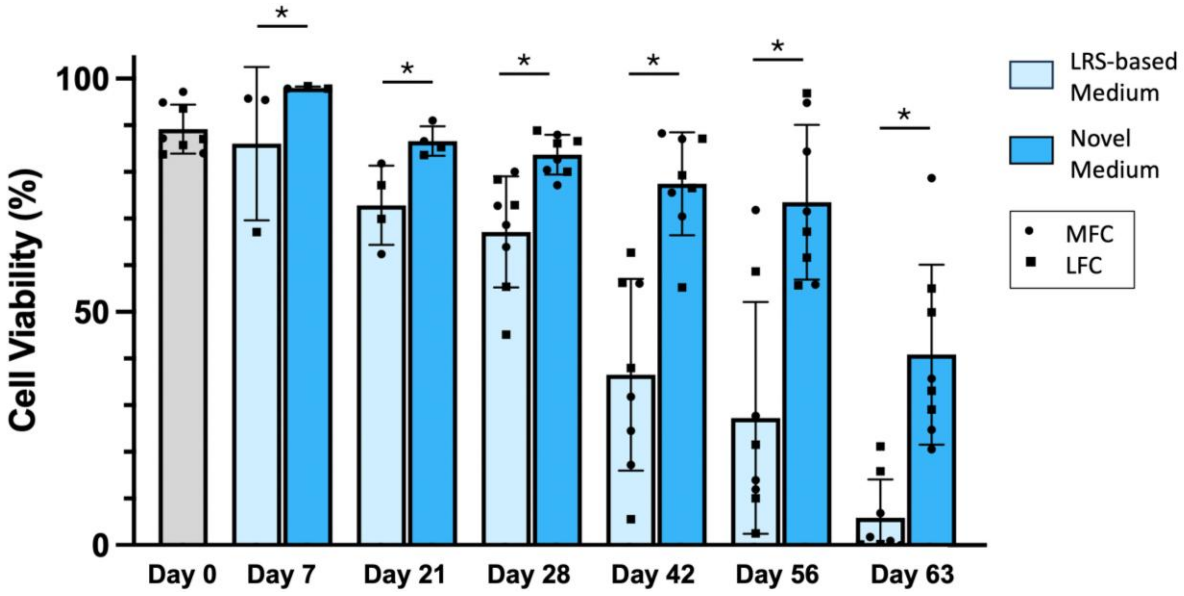
- Our medium improves viability and quality of chondrocytes on the articular surface of osteochondral transplants.

Research Team: Adele Changoor and Marc Grynpas

Development Stage: This work has been performed in rabbits.

Patent Status: US Patent Application filed.

Commercial Opportunity: Technology available for licensing and partnering with industry.



Absolute Cell Viability in the LRS-based and Novel Medium. Represented are the mean and standard deviation of the percent viable cells in sections of both the lateral femoral condyle (LFC) and medial femoral condyle (MFC) obtained from skeletally mature rabbits. Cell viability (%) is determined by dividing live cell density by total cell density. * = $p < 0.001$.

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