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Methods for Enhancing Cell Populations for Articular Cartilage Repair

Tech ID: 29131 / UC Case 2017-965-0

BRIEF DESCRIPTION

Cartilage lesion treatments require expanding cells from healthy donor cartilage which have limited availability and restricted potential to produce cartilage. This invention overcomes these challenges, presenting chemical and physical methods for enhancing cell populations capable of producing neocartilage. According to a 2015 global market report, tissue engineering technologies are expected to reach over 94B USD by 2022.

FULL DESCRIPTION

The invention features improved cell expansion and cell culturing methods for enhancing cell populations capable of producing neocartilage. UCI scientists discovered that introducing specific chemical and cellular agents during the cell isolation process and culturing the cells in 3-D yielded neocartilage implants with significantly more mechanical robustness compared to those not treated with the same parameters. Notably, the invention enables a large quantity of engineered cartilage implants to be produced from few cells. They have demonstrated with only a few cells, 1.5M cells can be generated and fully capable of synthesizing cartilage with functional properties similar to native cartilage. More specifically, if 133 primary cells (0.01mm³ biopsy) is needed to completely resurface an adult knee, the invention would enable neocartilage production from a biopsy the size of 1mm³ (1 uL) to yield enough cells to completely resurface cover 75 knees.

SUGGESTED USES

- » Tissue engineering applications
- » Neotissue repair and regeneration
- » Treatment for cartilage lesions or osteoarthritic disease

ADVANTAGES

- » Faster and efficacious neocartilage production
- » More mechanically robust neocartilage
- » Compatible constructs for whole tissue transfers
- » Chemical treatments may replace current mechanical treatments for generating cartilage implants
- » Neocartilage has functional properties on par with native cartilage

PATENT STATUS

Country	Type	Number	Dated	Case
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OTHER INFORMATION

CATEGORIZED AS

- » **Biotechnology**
 - » Health
- » **Materials & Chemicals**
 - » Biological
 - » Chemicals
- » **Medical**
 - » Disease: Musculoskeletal Disorders
 - » Research Tools
 - » Stem Cell
 - » Therapeutics
- » **Research Tools**
 - » Cell Lines
 - » Expression System
 - » Reagents

STATE OF DEVELOPMENT

In vitro evaluation of native and engineered tissues using cadaveric articular cartilage Assessed biomechanical and biochemical properties

RELATED CASES

2017-965-0

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