

Public Abstract

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Title:Development of the Human Ex Vivo Split Tissue Osteoarthritis Model

Osteoarthritis (OA) is a disease characterized by loss of functional articular cartilage with associated whole joint pathology and resultant pain and disability, which is projected to affect 59.4 million Americans by 2020. Unfortunately, there are currently no therapeutics available able to stop or reverse the disease progression of OA, which can largely be attributed to the variable nature of this disease. As such, there is a need for a more standardized approach to modeling OA.

In the current study, our laboratory set out to develop a valid and clinically applicable ex vivo model to unravel disease mechanisms and evaluate potential treatments for OA utilizing cartilage explants obtained from tissues discarded after standard-of-care joint surgeries. Cartilage explants were then cut into halves and cultured individually.

The specific objectives of this study were to validate consistency of relevant biomarker production between halves of osteoarthritic cartilage explants, and determine if candidate biomarkers can be detected in human osteoarthritic cartilage explant culture. A secondary focus of this study was to evaluate the disease-modifying capabilities of two clinically used therapeutics with this model. By using a 'split tissue' approach, we seek to control for variation in OA development and progression, leading to the identification of targets for prevention and treatment, as well as biomarkers for early diagnosis, disease staging, prognostication and treatment monitoring.