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The Effect of Passage on the Metabolic Profile of Osteoarthritic Chondrocytes

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INTRODUCTION

Osteoarthritis (OA) of the knee is one of the most common causes for disability in the U.S. The pathogenesis of OA is still lacking. Articular chondrocytes produce different levels of degradative and inflammatory biomarkers as OA progresses. It was hypothesized that the relationship in the production of biomarkers at P0 and P1 chondrocyte cultures are consistent with similar biomarker production levels between each passage.

METHODS

With IRB approval (IRB# 1208392), cartilage from end stage OA patients undergoing total knee arthroplasty (n=74) was collected. Chondrocytes were isolated and grown to confluency in supplemented DMEM. Once confluent (P0), media was changed and collected after three days for biomarker analysis. Cells were split, grown to confluency (P1), and media was collected for analysis after day 3. Data for P0 and P1 were compared for relative biomarker production levels ($p<0.05$) and a correlation was run for each passage ($r=0.5$)

RESULTS

Correlation within passages: A significant positive linear correlation was found in both P_0 and P_1 cells between RANTES, IL-8, MMP-1, MMP-2, MMP-13, MMP-8, MMP activity, and TNF-α. A negative linear correlation was found between TIMP-1 and IL-6.

Relationship between passages: P1 samples were grouped based on P0 production. There were not strong positive correlations between biomarker production at P_0 and P_1. A significant positive linear correlation was found in both P_0 and P_1 cells between RANTES and IL-8, MMP-1 and MMP-2, MMP-13 and MMP-8, MMP ACT and TNF-α. A negative linear correlation was found between TIMP-1 and IL-6.

CONCLUSIONS

The results suggest that there may be a relation in biomarker production level between passages for chondrocytes for some biomarkers, but this conclusion cannot be drawn for all biomarkers.