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## Influences of Patient Medication Use on Osteoarthritic Chondrocyte Metabolism


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**Introduction:**

Osteoarthritis (OA) is the leading cause of musculoskeletal disability in America. OA is often managed using medication for years prior to surgical intervention, with varied results. Many patients are also prescribed additional medications to manage medical comorbidities. Previous studies have indicated that OA chondrocytes maintain key phenotypic characteristics during initial *in vitro* culture. However, it is not clear if medications prescribed to treat OA and comorbidities (thyroid medications, thiazide diuretics, proton-pump inhibitors, angiotensin-converting enzyme [ACE] inhibitors, cyclooxygenase [COX]-2 inhibitors, non-steroidal anti-inflammatory drugs [NSAIDs], corticosteroids, opioid analgesics, and statins) impact chondrocyte metabolism during initial culture. Therefore, this study was designed to identify significant differences in production of OA-related biomarkers based on patient medication use prior to surgery.

**Methods:**

With IRB approval (IRB #1208932) and informed patient consent, cartilage tissue normally discarded during surgery was collected from patients undergoing total knee arthroplasty. Chondrocytes from these tissues were grown to confluence, media were changed, and cells were cultured for three days; a media sample was then collected. Media were analyzed for cytokines, degradative enzymes, inflammatory indicators, and matrix molecules. A Mann-Whitney U Test was utilized to identify significant differences between treated and untreated patient groups for each medication class, with $p<0.05$.

**Results:**

Significant differences in biomarker production between treated and untreated patient groups were observed for all medication classes except for COX-2 inhibitors. Differential chondrocyte expression of biomarkers was observed between medication classes, indicating unique impacts of each class upon OA chondrocyte metabolism.

**Conclusion:**

The findings of this study suggest that medication use prior to surgery may directly or indirectly influence biomarker production by OA chondrocytes. Each drug class may impact unique OA-related metabolic pathways through drug-specific or OA chondrocyte-specific mechanisms of action. Further investigation of these mechanisms may provide key insights regarding patient-to-patient variation in symptomatic knee OA development and progression.