**Abstract 5719**

**Lumican is a potential biomarker for osteoarthritis**

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Purpose

Fragmentation of small leucine rich proteoglycans (SLRPs), including decorin, biglycan, lumican, keratocan and fibromodulin, has been shown to occur in osteoarthritic articular cartilage (Melrose et al, 2008). The aim of this project was to determine whether SLRPs and their metabolites are potential biomarkers of osteoarthritis (OA). We determined whether SLRPs could be detected in synovial fluid of patients with and without OA. We also investigated the expression of SLRPs in an in vitro, cultured explant model of OA; and the effect of statin, a potential OA modifying agent (Clockaerts S et al.2012), on SLRP expression in this model.

##### Methods and Materials

Human synovial fluid was obtained from RJAH Orthopaedic Hospital, UK, and Adnan Menderes University, Turkey. Bovine articular cartilage (BAC) explants, were cultured in media containing interleukin-1 (IL-1), oncostatin M (OSM) and Simvastatin for 2-14 days. Proteoglycans were extracted from BAC explants in guanidine hydrochloride. Human synovial fluid, BAC extract and media were treated enzymatically to remove all post-translational modifications. SLRPs were detected using Western Blotting. Collagen content was determined by hydroxyproline quantification.

##### Results

Western Blot analysis showed that human synovial fluid contains lumican but no other SLRP. A 29kDa fragment of lumican was significantly elevated in patients with OA, compared to patients with no clinical signs of disease (p<0.01, Figure.1). Levels of lumican in extract and conditioned media of cultured BAC explants were markedly elevated with IL-1 OSM treatment, compared to un-stimulated controls (p<0.01), and significantly decreased with Simvastatin treatment (p<0.05, Figure 2), along with a significant decrease in collagen release (p<0.01).

##### Conclusion

We have confirmed the presence of lumican in human synovial fluid and shown that it is a potential biomarker of OA onset. We have further shown that lumican is elevated with degradation of articular cartilage, using an in vitro culture system that mimics OA, and conversely lowered with statin treatment.



