INTRODUCTION
Chondrocytes produce a hydrated pericellular matrix (PCM) which is rich in glycosaminoglycans, proteoglycan and distinct collagens; together they form a ‘chondron’ [1,2]. The precise function of the PCM is not known but it clearly has a major impact in regulating the biomechanical environment of the chondrocyte and influencing its activity [3]. The retention of the in vivo PCM has been reported to positively influence chondrocyte gene expression resulting in improved matrix production [4]. In this work, the effect of dynamic compression on gene expression of single chondrocytes and chondrons was investigated. The results may improve our understanding of how the PCM regulates its biomechanical environment and help improve current cartilage tissue engineering strategies.

METHODS
Single chondrocytes and chondrons were compressed at two levels of deformation (20% & 40%) using micromanipulation [5]. The gene expression of several matrix components and transcription factors was quantified using a novel single cell real-time RT-PCR assay.

RESULTS
Measurable levels of at least one gene were detected in 96/96 cells tested (100%). Of these, 100% expressed 18s, 100% expressed COL2, 93.8% expressed AGG, 91.7% expressed lubricin, 88.5% expressed osteopontin, 77.1% expressed SOX9, 33.3% expressed CFBA1, 32.3% expressed NF KappaB, 20.1% expressed Has2, and 10.0% expressed COL10.

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