

Identification of Human Chondroprogenitor cell populations

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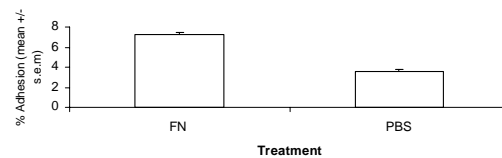
INTRODUCTION: We have previously identified a population of chondroprogenitor cells from the surface zone of bovine articular cartilage using differential adhesion to fibronectin (1). This population of cells can form large numbers of colonies from a low seeding density and is capable of extended culture without losing the chondrogenic phenotype. Here we show that human foetal and adult articular cartilage contain a population of cells with similar clonality to the bovine chondroprogenitor population and describe the effects of Notch signal modulation on Chondroprogenitor behaviour.

METHODS: Human foetal and adult cartilage was obtained with institutional ethical approval. Foetal femoral condyle cartilage was removed from 4 fetuses (71-86 days) and chondrocytes obtained by sequential pronase/collagenase digestion. Adult human femoral chondrocytes were obtained from patients undergoing hemiarthrotomy (54-64 yrs; normal cartilage obtained from non-diseased compartment) and isolated using sequential pronase/collagenase digestion. Isolated chondrocytes were subjected to differential adhesion to fibronectin and the initial adhesion and colony forming efficiency calculated, as previously described (1)

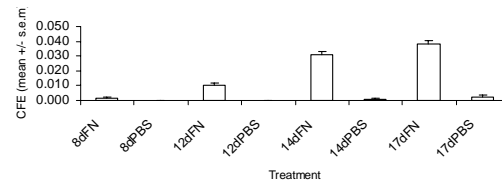
RESULTS:

Foetal chondrocytes plated onto fibronectin for 20 minutes were more adherent than foetal chondrocytes plated onto fibronectin for 40 minutes or foetal chondrocytes plated onto PBS for 20 or 40 minutes (Fig 1A, * $p < 0.01$) and showed increased colony forming efficiency at 6 and 10 days compared with controls (Fig 1B, * $p < 0.05$).

2A: Initial Adhesion of Adult Chondrocytes to Fibronectin



2B: CFE of Adult Chondrocytes



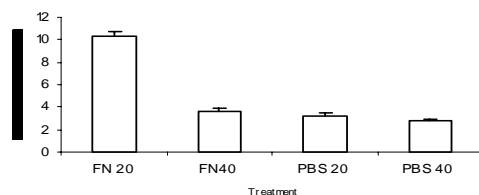
Adult chondrocytes plated onto fibronectin for 20 minutes were more adherent than chondrocytes plated onto PBS for 20 minutes (Fig.2A). Colonies first became apparent in human samples at 8 days and the CFE was greater at 12, 14 and 17 days compared with cells adhered to PBS (Fig 2B).

DISCUSSION & CONCLUSIONS: Using differential adhesion to fibronectin, we have shown that a subpopulation of both foetal and adult articular chondrocytes adheres to fibronectin in a short time span and that this adhered population is capable of forming large colonies. These results closely mimic those of the well defined bovine chondroprogenitor population (1).

REFERENCES: 1) Dowthwaite et al (2004). J. Cell Sci. 117, 889-897.

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1A Initial Adhesion of Foetal Chondrocytes to Fibronectin



1B: CFE of Foetal Chondrocytes

