

Is chondrocyte enrichment on vitronectin equivalent to fibronectin enrichment? A proof-of-concept study

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Background: Osteoarthritis is a common degenerative bone condition affecting the large weight bearing joints, where the cartilage in the joint has worn away. This causes pain, immobility and loss of economic independence. The most common solutions are pain relief and knee joint replacement. The field of regenerative medicine is aiming to repair worn cartilage by grafting lab grown patch into the joint. These methods require proteins that are found in the extra cellular matrix to be used in experiments.

Aim: Fibronectin is commonly used as it is reliable; this paper aims to see if vitronectin has equivalent function.

Method: Human chondrocytes were subjected to two different adhesion proteins in different media combinations of normal cell media, normal media plus FGF2 and normal media with FGF2 + TGFβ1. Six genes' expression were used to characterise the chondrocytes: Sox9, CD105, CD166, CD73, ITGA5, PRG4 and 18S for a housekeeping gene, by means of qPCR.

Results: The trends vary per gene. PRG4 only expressed on fibronectin with FGF2 and TGFβ1. The CD genes decreased their expression in the FGF2 and TGFβ1 media in vitronectin and fibronectin. ITGA5 was expressed more on vitronectin. Sox 9 was expressed more in FGF2 media compared to the other media in their respective adhesion protein groups. CD166 also showed it can differentiate between Fibronectin and Vitronectin.

Conclusion: As n=1 it is not possible to make any constructive inferences. The CD gene expression reduction indicates differentiation has occurred, but more samples need to be used to achieve statistical analysis.

