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# Evaluation of Cartilaginous Extracellular Matrix Production in In Vitro "Cell-Scaffold" Construct

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**Abstract**  
This study aims to evaluate the cartilaginous extracellular matrix (ECM) production in in vitro poly(lactic-co-glycolic acid) PLGA-based scaffolds seeded with rabbit chondrocytes. Scaffolds with the size of 7mm (diameter) x 3mm (height) using ratio of 65: 35 were formed using solvent-casting and salt leaching method. The scaffolds were divided into four respective groups, 1) PLGA-atelocollagen-fibrin (PAF), 2) PLGA-atelocollagen (PA), 3) PLGA-fibrin (PF), and 4) PLGA (control). Gross morphology of the scaffold was observed for 3 weeks. Microscopy evaluation and histological staining was done using Haematoxylin and Eosin (H&E), Safranin O, Alcian Blue, Toluidine Blue for week 1, 2 and 3, respectively. The production of sulphated glycosaminoglycan (sGAG) was evaluated using Alcian Blue assay. The PAF group presented better cartilaginous appearance compared to other groups. The hybrid scaffold groups showed more ECM secretion indicated by the presence of web-like fibers network substance on the surface as visualized using scanning electron microscope (SEM). The presence of proteoglycan-rich matrix and glycosaminoglycan has been detected in both histological staining and sGAG assay. Based on the findings of this study, PLGA-based hybrid scaffold promoted better cartilaginous tissue formation in vitro.

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