



## Cell seeding process optimization on polycaprolactone-gelatin-arcade-like-architecture-scaffolds

Carla Fernandes, Ângela Semitela, António Completo and Paula A.A.P. Marques

*TEMA- Department of Mechanical Engineering,*

*University of Aveiro 3810-193 Aveiro, Portugal*

The articular cartilage (AC) is a highly specialized tissue that exhibits anisotropic mechanical properties due to its structural organization that varies with depth. Because it is an avascular tissue, the regeneration capacity of cartilage tissue is limited. This situation, may lead to degeneration of cartilage in cases of injury, which limits not only the normal functioning of the articular cartilage but also the surrounding tissues. In this context, cartilage tissue engineering has been focusing on the development of methods aimed at achieving better results, like the growth of tissue in three-dimensional porous structures and implantation of the same in the affected site. The aim of this work is to optimize the seeding process of cartilage cells on specific scaffolds. For that, to better mimic the cartilage native structure, fibrous scaffolds of polycaprolactone (PCL) and Gelatin with distinct fiber orientation were produced by electrospinning. The incorporation of cells in the 3D architectures was performed using: a top and bottom pipetting procedure; an injection method with a syringe; and a compression technique. The validation of the results was performed through the measure of cell metabolic activity via a resazurin assay. By the analysis of the results, cell proliferation was detected, suggesting that these scaffolds are biocompatible and could provide a favorable microenvironment to the adhesion and growth of the tissue. Regarding the seeding techniques, the compression approach presented the highest cell viability, followed by top and bottom approach, indicating that the incorporation of cells was assured and potentiated through these techniques.

**Topic:** Biomaterials  
**Corresponding Author:** Carla Fernandes  
cpf@ua.pt  
University of Aveiro  
Aveiro, Portugal  
Telephone: +351234370803, Fax: +351234370953

**Presentation Type:**  Oral Presentation  Poster Presentation

**Keywords:** cartilage tissue engineering, PCL/Gel Scaffolds, Cell seeding techniques