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Autologous bioscaffolds based on different concentrations of platelet rich plasma and synovial fluid as a vehicle for mesenchymal stem cells

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In the field of tissue engineering, diverse types of bioscaffolds are being developed currently for osteochondral defect applications. In this work, a novel scaffold based on platelet rich plasma (PRP) and hyaluronic acid with mesenchymal stem cells (MSCs) has been evaluated to observe its effect on immobilized cells. The bioscaffolds were prepared by mixing different volumes of synovial fluid (SF) with PRP from patients obtaining three formulations at PRP-SF ratios of 3:1, 1:1 and 1:3 (v/v). The live/dead staining revealed that although the cell number of each type of bioscaffold was different, these constructs provide cells with a suitable environment for their viability and proliferation. Moreover, immobilized MSCs showed their ability to secrete fibrinolytic enzymes, which vary depending on the fibrin amount of the scaffold. Immunohistochemical analysis revealed the positive staining for collagen type II in all cases, proving the biologic action of SF derived MSCs together with the suitable characteristics of the bioscaffold for chondrogenic differentiation. Considering all these aspects, this study demonstrates that these cells-based constructs represent an attractive method for cell immobilization, achieving completely autologous and biocompatible scaffolds.

Biography

Ane Garate has completed her PhD in Pharmacy at the University of The Basque Country. During her training, she realized a research stay in the Department of Biomedical Engineering of Case Western Reserve University (Cleveland, USA). Since 2015, she is a Member of Advanced Biological Therapy Unit (UTBA) of Mikel Sánchez where she focuses her work in Regenerative Medicine and Cell Therapy applied in Orthopedics.

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