

عنوان مقاله:

Decellularized kidney in the presence of chondroitin sulfate as a natural 3D scaffold for stem cells

محل انتشار:

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خلاصه مقاله:

Objective(s): Use of biological scaffolds and automating the cells directing process with materials such as growth factors and glycosaminoglycans (GAGs) in a certain path may have beneficial effects in tissue engineering and regenerative medicine in future. In this research, chondroitin sulfate sodium was used for impregnation of the scaffolds. It is a critical component in extracellular matrix and plays an important role in signaling pathway; however, little is known about its role within mammalian development and cell lineage specification. Materials and Methods: Due to its porous and appropriate structure and for putting cells in 3D space, the kidney of BALB/c mouse was selected and decellularized using physical and chemical methods. After decellularization, the scaffold was impregnated in chondroitin sulfate solution (CS) for 24 hr. Then,  $6 \times 10^5$  human adipose-derived mesenchymal stem cells were seeded on the scaffold to assess their behavior on day 5, 10, 15, 20, and 25. Result: After 48 hr, DAPI staining approved completed decellularized kidney by 1% SDS (sodium dodecyl sulfate). Migration and establishment of a number of cells to the remaining area of the glomerulus was observed. In addition, cell accumulation on the scaffold surface as well as cells migration to the depth of kidney formed an epithelium-like structure. Up to the day 15, microscopic study of different days of seeding showed the gradual adhesion of large number of cells to the scaffold. Conclusion: Glycosaminoglycan could be a right option for impregnation. It is used for smartification and strengthening of natural scaffolds and induction of some behaviors in stem cells.

کلمات کلیدی:

Acellular scaffold, Chondroitin sulfate, Mesenchymal stem cell, Cell communication, Cell interaction, Extracellular matrix

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