

عنوان مقاله:

Impact of collagen on alginate-chitosan (AC) microcapsules for hepatocytes microencapsulation

محل انتشار:

اولین کنگره بین المللی مهندسی بافت و پزشکی بازساختی ایران (سال: 1397)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Shahla Khodabakhsh Aghdam - *Tissue Engineering and Stem Cell Research Lab, Chemical Engineering Faculty, Sahand University of Technology, Tabriz, Iran*

Ali Baradar Khoshfetrat - *Tissue Engineering and Stem Cell Research Lab, Chemical Engineering Faculty, Sahand University of Technology, Tabriz, Iran*

Hoda Jafarizadeh-Malmiri - *Chemical Engineering Faculty, Sahand University of Technology, Tabriz, Iran*

خلاصه مقاله:

Introduction AC microcapsules as alternative 3D culture have potential for encapsulating liver cells in regenerative process. Because of the anionic surface of pure alginate, cell-matrix interaction decreases leading to low viability and liver functions. As collagen is a major component of extracellular matrix and presents the capability of specific cell interactions, it can be added to the core of AC microcapsules for its characteristics improvement. Objectives Effect of collagen on microcapsule characteristics (permeability, swelling, stiffness) and cell behavior (proliferation, functionalities) has been investigated. Methods To discern the mechanical property of capsules, hydrogels were placed in a material testing machine (Zwick/roell Z010, Germany) and compacted with a crosshead speed at 2.0 mm/min. For swelling test, microcapsules were put in PBS solution at 37 for 7 day. For permeability of the microcapsules, release of bovine serum albumin (BSA) was investigated. Finally for cell functionalities, HepG2 cells as a model of hepatocytes were suspended in alginate-based solution with density of 2×10^6 cells/ml. Microcapsules were then prepared by means of an electrostatic microencapsulation method. Results Collagen increased the bead mechanical resistance but lowered the mass transfer of albumin. Young's modulus for AC and alginate-collagen/chitosan (ACol/C) respectively are 9Kpa and 11Kpa respectively. MTT assay for cell proliferation was showed 28% increasing on day 10 and secretion of albumin in ACol/C microcapsules was increased. Conclusion The results obtained in this research demonstrated that the ACol/C microcapsules are suitable for hepatocyte microencapsulation, indicating great significance to improve hepatocyte viability and liver-specific functions.

کلمات کلیدی:

HepG2 cell line, Microcapsule, Collagen, Mechanical stability

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/905786>



