

RECENT DEVELOPMENT OF MICROCARRIER FOR CELL CULTURE ENGINEERING

Edited By
Maizirwan Mel
Yusilawati Ahmad Nor
Iis Sopyan
Ahmad Fadli



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Evaluation on Biological Performance of Porous Pure and Magnesium-Doped Biphasic Calcium Phosphate Ceramics Using Vero Cell Culture

Toibah Abd Rahim, Iis Sopyan, Maizirwan Mel, Ahmad Fadli

1. Introduction

The scaffolds designed for tissue-engineering applications should be three-dimensional (3D), highly porous and interconnected to support cell attachment as well as proliferation. Porous calcium phosphate scaffolds may improve the functionalities of cell and tissue to sustain the adhesion and growth of cells by providing a large surface area and pore structure within a 3D structure. They should have sufficient structural integrity matching the mechanical properties of native tissue. Porosity provides sufficient space, allows cell to be in suspension, and penetrates the three-dimensional structure. Therefore, suitable pore size distribution is very crucial for transportation of nutrients and wastes. The scaffolds should offer ideal and critical micro-environment so that they can function as an artificial extra-cellular matrix (ECM) onto which cells attach, grow, and form new tissues (Shor, et al., 2007). In vitro study studies must be performed with cell cultures in order to establish the porous ceramics basic biological interactions such as cell attachment behaviour, cell proliferation and cell differentiation (Charles-Harris, et al., 2008).