

Characterization of Mesenchymal Stem Cells and Microcarriers

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Stem cells are undifferentiated cells with the ability to differentiate into various specialized cells if appropriate growth conditions are provided. The use of mesenchymal stem cells (MSCs) in cell therapy (1) and regenerative medicine (2) has been limited by their cell source quantity. Since MSCs are only available in small numbers in the human body, they need to be isolated and expanded. Microcarriers have been employed successfully for their expansion (3). The main goal of this study is to determine the correlation of the properties of the microcarriers (such as roughness, zeta potential and hydrophobicity) to their interaction with MSCs. Therefore, three microcarrier beads (cytodex-1, plastic and plastic plus) are characterized with scanning force microscopy, powder contact angle measurement, and X-ray photoelectron spectroscopy. The interactions (adhesion and elasticity) of the microcarriers and the MSCs will be measured by scanning force microscopy (SFM).

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