

Cell technologies for spinal fusion

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Abstract

For a successful spinal fusion to occur, several vital elements are necessary. They consist of the presence of the bone-forming cell (osteoblast) or its precursor, the appropriate biological signals directing bone synthesis, and a biocompatible scaffold on which the process can occur. The most critical of these components is the osteoblast or its precursor, the mesenchymal stem cell (MSC), both of which possess the ability to form bone. As a result, many current techniques attempt to maximize the benefits derived from harvesting the ready source of MSCs from bone marrow, while minimizing the associated complications. These cellular technologies seek to improve on the harvest and concentration of the MSCs or enhance their delivery and action. This review focuses on the terminology, historical underpinnings, and current research rationale and techniques and discusses the possible future of these technologies. © 2005 Elsevier Inc. All rights reserved.

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