

Mesenchymal stem cell-based HLA-independent cell therapy for tissue engineering of bone and cartilage. Niemeyer P1, Krause U, Kasten P, Kreuz PC, Henle P, Südkam NP, Mehlhorn A. *Curr Stem Cell Res Ther.* 2006 Jan;1(1):21-7.

Abstract

Mesenchymal stem cells (MSC) can be obtained from human bone marrow aspirates and, thanks to their differentiation potential and excellent in vitro culture properties, represent an attractive cell line for the regeneration of mesenchymal tissue. Both in vitro and in vivo, they can differentiate into cartilage, bone, tendons and fat cells, and-in contrast to embryonic stem cells-they are not under ethical scrutiny. Cultured on three-dimensional scaffolds according to the tissue engineering concept, they have already been successfully employed for reconstruction of mesenchymal tissues in numerous studies involving both small and large animal models. Recently, immunological properties of MSC have been investigated by several groups. On the basis of the available literature, MSC have to be referred to as immune privileged, and they seem to be available for HLA-independent cell transplantation. While clinical MSC transplantation has also been successfully performed in pilot studies in humans, numerous points still remain to be clarified, underscoring the need for further intensive research before large-scale clinical application can be contemplated. Only then can it be shown whether the associated high expectations are justified.