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Epigenetic Changes in Mesenchymal Stem Cells Differentiation

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Abstract

Epigenetic factors are known to play a major role in determining stem cell fate and differentiation. Mesenchymal stem cells are the most studied population of stem cells due to their important applications in experimental biology and regenerative medicine. After a brief overview on mesenchymal stem cells, this review aims to highlight the role of epigenetic changes on mesenchymal stem cells biology and differentiation protocols with a focus on osteocytic, chondrocytic and adipocytic differentiation. Chromatin remodeling, DNA methylation, histone modifications and miRNA expression will be investigated. The impact of epigenetics on transdifferentiation of mesenchymal stem cells will also be discussed. Indeed, epigenetic modulation appears to constitute a promising experimental target in stem cell basic and translational research.

Keywords: differentiation; epigenetics; osteogenesis; chondrogenesis; adipogenesis

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