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POSTER

Influence of Graphene oxide and Collagen-based biomaterials modulate the characteristic of Human Amnion-Derived Mesenchymal Stem Cells

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Abstract

Biomaterials serve as a fundamental component of tissue engineering. They are designed to imitate the native extracellular matrix to support cell growth. Tissue regeneration has the potential to achieve this by combining biomaterials design with cells from the body. The objectives of this study are to examine how biomaterials regulate the expression of genes related to proliferation, pluripotency and differentiation of amnion-derived mesenchymal stem cells (AM-MSCs). AM-MSCs co-cultured with collagen and GO showed comparable proliferation rate as compared to controls. Induction of osteogenic and adipogenic differentiation media on AM-MSCs was not affected by these biomaterials although collagen was found to promote adipogenesis in normal medium. The RT-PCR results showed that cells co-cultured with collagen downregulated the expression of pluripotency genes, stem cell surface markers while increased the expression of adipogenic genes. In contrast to collagen, GO increased the expression of pluripotency genes. In conclusion, these biomaterials differentially modulate the gene expression of surface markers and several differentiation genes without influencing cell viability.

Keywords

AM-MSCs, Graphine Oxide, Collagen Type 1

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References