INTRODUCTION

Stem cells are defined as clonogenic cells capable of self-renewal and multi-lineage differentiation. A population of these cells has been identified in human dental pulp. Dental Pulp Stem Cells (DPSCs) were found in adults teeth and have been shown to differentiate, under particular conditions, into various cell types of the mesenchymal tissues. In this work we studied the immunophenotype of DPSCs by flow cytometric analysis. DPSCs were then cultured in osteogenic medium and the osteoblastic markers were analyzed by histochemical method and real-time PCR. In particular, the typical osteoblast markers such as Alkaline Phosphatase (ALP), Collagen type-I (Coll-I), RUNX2, Bone Morphogenetic Protein 2 (BMP-2) and Osteopontin (OPN), as well as mineralized matrix production were detected.

Mesenchymal markers are expressed by DPSCs

Osteoblast markers are expressed by DPSCs cultured in osteogenic medium

We demonstrated that DPSCs successfully differentiated into osteoblast-like cells, producing mineralized matrix nodules and expressing the typical osteoblastic markers, such as Alkaline Phosphatase, Collagen type-I, RUNX2, Osteopontin and BMP-2. This study suggests that DPSCs, differentiating into osteoblasts, represent a perfect source of cell for bone regeneration.

CONCLUSION