

Periodontal regeneration capacity of human periodontal ligament-derived stromal cells

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Restoring periodontal defect is still one of the clinical challenges; this is due to the complex structure and diversity of cell types in this joint. The advancement in tissue engineering and cell therapy, make it possible to recruit these approaches to overcome this challenge. This study aims to investigate the capacity of HPDLSCs to differentiation into the main periodontal cell types and enhance the regeneration process.

The isolated HPDLSCs were cultured to be characterised for the presence progenitor cell using colony forming unit method. Flow cytometry was used to measure the expression of mesenchymal and hematopoietic cell markers. Furthermore, multilineage cells differentiation was induced. Cells then were seeded on silk scaffold and incubated both in vitro and in vivo in nude mice to examine cellular growth and differentiation.

The isolated cells expressed a higher level of MSCs markers in comparison to Hematopoietic markers. Also, these cells showed the ability to proliferate and differentiate into osteogenic, fibrogenic, chondrogenic and adipogenic cues. In Vitro and In Vivo experiments demonstrated the ability of those cells to attach and spread on silk scaffold; In addition to the cellular activities that became evident through the formation of collagen fibres along with the deposition of extracellular minerals.

In conclusion, HPDLSCs possess the essential progenitor cells that could differentiate into the primary periodontal cells; Thus, enhancing the periodontal regeneration process.