

The footprint of stem cells in pyogenic granuloma; a lesion of oral cavity

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Stem cells are considered for tissue regeneration. Even though the human dental pulp stem cells have been widely characterized, it is still mysterious whether reactive lesions of oral cavity such as pyogenic granuloma (PG) which is a non-neoplastic tumor may offer a non-invasive source of cells for therapeutic purposes. A complementary key in gradient in regenerative medicine and tissue engineering is using of biologically compatible scaffolds that can be readily adopted by the body system without harm. In this study the potential of PGSCs to differentiate into hepatocytes within a 3D nanofibrous scaffold composed from Poly caprolactone has been investigated. The cells from the excisional biopsy were cultured and the expression of the CD markers was evaluated by flow cytometry and immunofluorescence. They also differentiated into adipocytes and osteoblasts. These cells display stem cell-like phenotypic markers and show great potential for self-renewal, plasticity, and undifferentiated proliferation for long periods of time in vitro. These cells showed the capability to differentiate into adipocytes and osteoblasts. Unlike undifferentiated cells, cultured PGSCs on scaffold in presence of hepatic conditioned media significantly expressed mature hepatocyte mRNA such as albumin, tyrosine amino transferase, hepatic nuclear factor, cytokeratin 18 and 19, cytochrome P2B6, glucose-6-phosphatase and claudin on day 30 of differentiation judged by real time-polymerase chain reaction. Great synthesis and production of albumin protein by differentiated PGSCs was shown by immunofluorescent staining and enzyme-linked immunosorbent assay using monoclonal antibody against albumin protein. The data presented in this study show that the nanofibrous scaffold is a conductive matrix which supports PGSCs development into functional hepatocyte-like cells.

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