

Isolation of pluripotent like stem cells from the apical papilla tissue of impacted third molars

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Abstract

Introduction: Regarding limited differentiation potential of multipotent stem cells, focus has been shifted towards finding a novel source of stem cells with broader differentiation potential, which can be used to treat diseases like: Diabetes Mellitus, neurodegenerative disorders e.g. Parkinson's disease and spinal cord injury. Different types of dental stem cells are considered as the promising source to be able to treat such kind of diseases due to ease of their availability.

Objective: Our aim was to investigate a population of pluripotent stem like cells with germinal differentiation potential from apical papilla (P-SCAP) of impacted third molars.

Methods: Pluripotent like stem cells were isolated from apical papilla by explant method while culturing them in a specific media (essential 8 flex). Cells were characterized for their morphological appearance, expression profile and differentiation potential towards three germ layers.

Results: P-SCAP were isolated successfully from apical papilla of impacted third molars with pluripotency features. The morphological appearance of P-SCAP similar to another pluripotent cell as they have a high nucleus to cytoplasmic ratio. Additionally, P-SCAP showed a high expression of ALP enzyme. Moreover, PSCAP were able to express pluripotency markers such as; SSEA4 (12%), SSEA3 (12.65%), Oct3/4 (65.9%), Nanog (27.93%), and TRA-81(9.8%). In regard to the differentiation potential; PSCAP were able to differentiate toward the three embryonic layers; mesoderm, ectoderm and endoderm.

Conclusion: The derived P-SCAP, opened the doors towards a new promising source of stem cells to be applied in regenerative medicine

Biography

Dua'a Abuarqoub is an assistant professor in University of Petra-Jordan. She finished her PhD in "Stem Cell Biology", from the University of Jordan. She also holds an MSc in "Applied Biosciences-Stem cell biology" and a BSc in "Biotechnology and genetic engineering" from Jordan university of science and technology. She is working as a researcher in Cell Therapy Center -The university of Jordan. She is the head of dental stem cell research project, working on different types of dental stem cells, exploring their features and their differentiation potential toward different lineages. She is the head of flow cytometry core lab. She has over 11 publications about stem cells, and nanobiotechnology.vv



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