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# In vitro cardiomyogenic differentiation of human dental pulp stem cells. The role of 5-azacytidine

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Cellular cardiomyoplasty has been introduced as a potential therapy for treating heart failure and has generated significant interest in identifying various cell types capable of restoring the injured myocardium. Autologous human dental pulp stem cells (hDPSCs) show the ability to differentiate into various cell type such as osteoblasts[1], chondroblasts, and adipoblasts. Aim of this study is to investigate the aptitude of hDPSCs to differentiate towards a cardiomyogenic phenotype *in vitro*. In this study we developed an efficient protocol for the generation of functional cardiomyocytes. Second passaged cells were treated with 5$\mu$M of 5-azacytidine[2], a well-known demethylating agent, for 48h. Initial exposition of cultured hDPSCs to 5-azacytidine leads to development of embryoid bodies (EBs) expressing specific transcripts markers of the three germ layers as : ectoderm (MAP2), mesoderm (MSX1), and endoderm (PAX6) and various precardiac markers including MYH6, MESP. EBs subsequently plated onto gelatin-coated tissue culture dishes express cardiac markers as Nkx2.5 and connexin 43 determinated by PCR and immunofluorescence analysis at confocal microscopy, indicating that EBs can differentiate into functional cardiomyocytes. These results demonstrate that hDPSCs can be an easily source of stem cells able to undergo versus the cardiomyiogenic lineage.

### References

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Keywords
Human stem cells, dental pulp, 5-azacytidine, differentiation, embryoid body, cardiomyocytes.