control group. The present results suggest that PEMF with the defined parameters has the ability to increase the up-regulation of SOX9 gene expression in ADMSCs cultured inalginate constructs.

Conclusion: PEMF enhances the deposition of extracellular matrix molecules and augments SOX9 mRNA levels. Optimization of PEMF parameters can improve the chondrogenic potential of AD-MCSs and could be applied for cartilage defects.

Keywords: Adipose-Derived Mesenchymal Stem Cells, Electromagnetic Field, SOX9, Electromagnetic Transduction

Ps-78: A Comparison of The Osteogenic and Chondrogenic Potential of Mouse Dental Pulp Stem Cells

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Objective: The purpose of this study was to investigate the Chondrogenic and Osteogenic capacity of mouse dental pulp cells and identifying gene expression, cell viability, Morphological characterization for dental pulp stem cell differentiation.

Materials and Methods: For the dental stem cells culture, Alpha Modification of Eagle's Medium (AMEM), 15% FBS and 1% penicillin/streptomycin were used as a complete media. The chondrogenic medium contained ulbecco's Modified Eagle's Medium (DMEM) supplemented with 10 ng/mL TGF- ß1, 50 µg/mL ITS+, 50 µg/mL ascorbate-2-phosphate, 100 nM Dexamethasone. For differentiate to osteoblast, 50 µg/mL ascorbic acid and 10 mM ß-glycerol phosphate and to induce osteoclast differentiation, 10 ng/mL RANKL and 5 ng/mL M-CSF were added to complete medium.

Results: In RT-PCR molecular analysis, mouse dental pulp stem cells (DPSC) were observed to express Cd146 and Cd166 genes, which indicated that these cells belong to mesenchymal stem cells. Collagen II as mature chondrocyte markers and OPN as an osteoblast marker were expressed after 14 days and 21 days during chondrogenic and osteoblastic differentiation, respectively. While the non activation of CatK as osteoclast markers after induction, indicates these cells have not differentiated into osteoclast. After 21 days the cell morphological characters were changed when exposed to chondrogenic and osteoblastic induction medium whereas similar morphological were produced in both control and osteoclast differentiated medium groups. Using toluidine blue staining and von Kossa staining indicated the presence of glycosaminoglycans and calcium nodules which is evident of successful chondrogenic and osteoblastic differentiation, respectively. Cell viability during the differentiation showed that these cells preserved their viability during differentiation, however after 16 days and 7 days in osteoblast and chondrocyte differentiation medium respectively, the amount of differentiated cells viability as compared to the control cells was significantly decreased ($p<0.05$).

Conclusion: This study indicated that DPSC with high proliferation rate had chondrogenic and osteoblastic differentiation capacity but does not possess osteoclastic differentiation ability.

Keywords: Dental Pulp Stem Cell, Osteogenic, Chondrogenic

Ps-79: Laminin Coating Stimulates Polarity, Protein Synthesis, and Metabolism of Hepatocyte-Like Cells Differentiated from Human BM-MSCs

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Objective: Application of stem cells in cell therapy and tissue engineering for treatment of liver diseases are considered as alternative approach to liver transplantation. So far, extensive studies have been taken to improve hepatogenic differentiation efficiency of different types of stem cells; but not much of interest has been paid to the polarity of the *in vitro* differentiated cells. The aim of our study was to investigate the effect of laminin on polarity of hepatocyte-like cells differentiated from Human bone marrow (BM)-derived mesenchymal stem cells (BM-MSCs) as well as the protein synthesis and metabolism.

Materials and Methods: The characteristics of MSCs obtained from Royan Institute were confirmed by immunophenotyping analysis and their differentiation potential into osteocytes and adipocytes. Hepatogenic differentiation was induced by hepatocyte growth factor, Oncostatin M, and dexamethasone. Undifferentiated human MSCs were used as negative control. On day 21, Immunostaining for albumin (Alb) and alpha-fetoprotein (AFP) were performed to evaluate the characteristics of the differentiated cells. Furthermore, urea production was evaluated to measure the detoxification capacity of the cells. Finally, F-actin staining was performed to analyze the polarity.

Results: The flowcytometry findings revealed that over 90% of the cells expressed the MSC markers but not hematopoietic and leukocyte markers. Also mineralization and oil droplets showed their differentiation potential into osteocytes and adipocytes. The results of immunocytochemistry revealed higher expressions of both AFP and Alb (specific markers of liver) in cells differentiated on laminin matrix compared to that of the control group. Additionally, the results showed that