

**Abstract**

**THE EFFECT OF FREEZE DRIED BOVINE BONE XENOGRAFT ON THE  
RUNX-2 EXPRESSION IN HUMAN BONE MARROW MESENCHYMAL  
STEM CELL IN VITRO CULTURE**

**Background:** Nowadays tooth implantation is becoming one of main treatment to rehabilitate chewing and estetic function after tooth loss. Tooth loss can cause negative effects for the patient in the form of a reduction in alveolar bone dimension which it need for tooth implant. To overcome this problem, the clinician can use alveolar bone grafting procedure to stimulate wound healing and stabilize the dimension of the alveolar bone. Freeze Dried Bovine Bone Xenograft (FDBBX) is a graft derived from bovine bones, and processed by means of freeze drying also called lyophilization. FDBBX has a osteoconductive and osteoinductive ability, osteoinductive can increase osteoblastic differentiation which is sign by increasing in RUNX-2 expression. Implantation of bone graft at the alveolar bone defect does not always compatible, to know the compability we must know is this FDBBX has osteoconductive by see a RUNX-2 expression. RUNX-2 is transcription factor which is exist in osteoblast differentiation. Human bone marrow mesenchymal stem cell (hBM-MSC) is representation of a stem cell which is a multipoten adult cell found in many tissues.

**Objective:** This study aims to evaluate FDBBX effect on the RUNX-2 expression in human bone marrow mesenchymal stem cell (hBM-MSC) culture.

**Method:** The sample of hBM-MSC culture was divided into two groups, a control group in normal medium and a treatment group in which the culture was induced by FDBBX-conditioned medium 2,5% dilution. In both groups, RUNX-2 expression after one, three, and seven days were evaluated. Replication of each sample group consisted of five samples. Immunohistochemistry is used to analyze RUNX-2 expression. Statistic analyse used in this study are Brown-Forsyth and Post Hoc Games Howell.

**Result:** There were diiference of expression RUNX-2 in hBM-MSC cultures in treatment group on the first, third, and seventh day clinically although statistically there is no difference.

**Conclusion:** FDBBX induces RUNX-2 expression in vitro which means it has osteoconductive potential.

**Keywords:** Freeze Dried Bovine Bone Xenograft, RUNX-2, human bone marrow mesenchymal stem cell