

ABSTRACT**COMPARISON BETWEEN RUNX2 AND OSTEOCALCIN EXPRESSION
FOLLOWING THE APPLICATION OF DEMINERALIZED
FREEZE-DRIED BONE XENOGRAFT (DFDBX) AND BOVINE
HYDROXYAPATITE (BHA)
AND THEIR EFFECT ON BONE DEFECT
(*In vivo* Laboratory Experiment)**

Background: The use of biomaterial such as bone graft material is highly needed in oral and maxillofacial surgery to overcome bone defect that happened due to various reasons. One of the bone graft that widely used is bovine hydroxyapatite (BHA). BHA is produced by means of deproteinizing by a high-temperature heating process so that inorganic material of bone is left where the bone architecture is preserved. This material has osteoconductive property because it induces osteoblast activity and new bone formation. DFDBX is a bone graft derived from bovine bone which has undergone the demineralization process and subsequently frozen. Then, it will be exposed to hydrochloric acid until the bone matrix component-related collagen fibril called BMPs. Runt-Related Transcription factor 2 (RUNX2) is a transcription factor which is needed for osteoblast differentiation and it is first detected at preosteoblast. Osteocalcin is exerted during the last stage of differentiation, started at the early stage of mineralization. **Objectives :** To compare the expression of RUNX2 and Osteocalcin following the application of DFDBX and BHA to the bone defect. **Method:** 30 male New Zealand White Rabbit, 6-months old, 3-3,5kg, divided into 3 groups comprising of 10 animals each, bone defect is created on each animal model. On group 1, DFDBX is applied, BHA is on group 2, and control group with no graft application. After 2 weeks and 4 weeks following the animal model is terminated to retrieve a bone specimens for Immunohistochemistry examination. **Result:** The expression of RUNX2 following the application of DFDBX and BHA showed a significant difference at week 2 but not showed at week 4. This research also found that the expression of osteocalcin did not show a significant difference at week 2 but showed a significant difference at week 4. **Conclusion :** This study demonstrate that bone healing process in DFDBX group is more effective than BHA

Keywords: DFDBX, BHA, RUNX2, osteocalcin, IHC