

## R–12. Enhancement of osteopromotion with synthetic oligopeptide domain coated anorganic bovine hydroxyapatite

Jun-Beom Park<sup>1</sup>, Ho-Nam Park<sup>1</sup>, Yoon-Jeong Park<sup>2,3</sup>, Yang-Jo Seol<sup>1</sup>, Sang-Cheol Lee<sup>1,3</sup>, Kyoung-Hwa Kim<sup>1,3</sup>, Tae-Il Kim<sup>1</sup>, Yong-Moo Lee<sup>1</sup>, Young Ku<sup>1,3</sup>, In-Chul Rhyu<sup>1</sup>, Soo-Boo Han<sup>1</sup>, Chong-Pyong Chung<sup>1,3</sup>

<sup>1</sup>Department of Periodontology, College of Dentistry, Seoul National University, Seoul, Korea

<sup>2</sup>Craniofacial Reconstructive Sciences Major, School of Dentistry, Seoul National University, Seoul, Korea

<sup>3</sup>Intellectual Biointerface Engineering Center, KOSEF, Seoul, Korea.

### Background

A synthetic peptide sequence of corresponding to the cell binding was demonstrated to be involved in binding of cells particularly fibroblasts and osteoblasts. Incorporation of these peptides into the microstructure of anorganic bone grafting material can be expected to facilitate and expedite the ingrowth of bone by promoting the immigration of reparative cells from the surrounding tissues.

### Object

The purpose of this study is to evaluate the bone regenerative potential of synthetic oligopeptide-containing bovine bone compared to deproteinized cancellous bovine bone.

### Method

Four adults white rabbits of New Zealand stock were used in this study. The critical size calvarial defect was created using a trephine bur with copious saline irrigation. After removal of the trephined calvarial bone, the peptide-coated bovine bone were implanted on one side and the bone mineral without any coating on the other side. The average percentage of new bone formation for the test and the control sites was determined from the two most central sections.

### Results

No specimen revealed any evidence of inflammatory tissue reaction and all wounds showed a good healing response. At 2 weeks postsurgery, the control wound showed

large amount of new bone formation and the experimental sites showed similar appearance but the height of new bone showed significant increase compared to the control. At 4 weeks, postsurgery, the test and control site showed increased new bone formation.

In the histomorphometric analysis, statistically significant differences in the percentage area occupied by newly generated bone were found between the experimental and control sites in two week period. The total areas of regenerated bone at 4 week of the test sites were greater than those of the control group, but there were no significant differences between two groups.

### **Conclusion**

The use of deproteinized cancellous bovine bone combined with a synthetic cell-binding peptide appears to be a more beneficial material for bone regeneration in the early healing period.