

### PR-1-3. Histomorphometric evaluation of bone healing with microporous biphasic calcium phosphate ceramics in rabbit calvaria

Jong-Sik Lee<sup>1\*</sup>, Hyun-Uk Ahn<sup>2</sup>, Dong-Jun Yang<sup>2</sup>, Seok-Kyu Choi<sup>2</sup>,  
Kwang-Bum Park<sup>2</sup>, Jae-Mok Lee<sup>1</sup>, Jo-Young Suh<sup>1</sup>, Jin-Woo Park<sup>1</sup>

1 Department of Periodontology, School of Dentistry, Kyungpook National University

2 Megagen Co., Ltd

#### Background

Biphasic calcium phosphate (BCP) ceramics with 60/40 hydroxyapatite/ $\beta$ -tricalcium phosphate weight ratio have shown good osteoconductivity because of their controlled resorbability and bioactivity in vivo. The purpose of this study was to histomorphometrically evaluate the osteoconductivity of a new bone graft substitutes (BCP-N) which have a macro-design of internal pores with a diameter of 400–500  $\mu$ m, which may be favorable for new bone ingrowth, surface structure characteristic of three dimensionally, well-interconnected micropores, and a chemical composition and crystallinity similar with those in MBCP® (Biomatlante, France).

#### Materials and methods

Osseous defects created in the rabbit calvaria were filled with three different bone graft substitutes. Experimental sites were filled with BCP-N. MBCP and deproteinized bovine bone (Bio-Oss (BO); Geistlich Pharma, Switzerland) were used as control in this study. Histomorphometric evaluation was performed at 4 and 8 weeks after surgery.

#### Results

In histologic observation, new bone formation and direct bony contact with the graft particles were observed in all three groups. In BCP-N group, new bone formation was observed in the internal area of bone particles as well as in the macropores. At 4 weeks, BCP-N group ( $15.5 \pm 3.2\%$ ) showed greater amount of newly formed mineralized bone (NB%) compared to BO ( $11.4 \pm 4.6\%$ ) and MBCP ( $10.3 \pm 4.6\%$ ) group, but which was not statistically different. At 8 weeks, there was no differences in the amount of NB% between groups, greater NB% was observed compared to 4 weeks.

## Conclusion

These results indicate that a new bone substitute, BCP which has a macro-design of 400~500 $\mu\text{m}$  sized internal pore and surface structure characteristic of three dimensionally interconnected micropores, has the osteoconductivity comparable to that of commercially available bone substitutes, MBCP and Bio-Oss.