

OssGen

# Collagen Putty Type

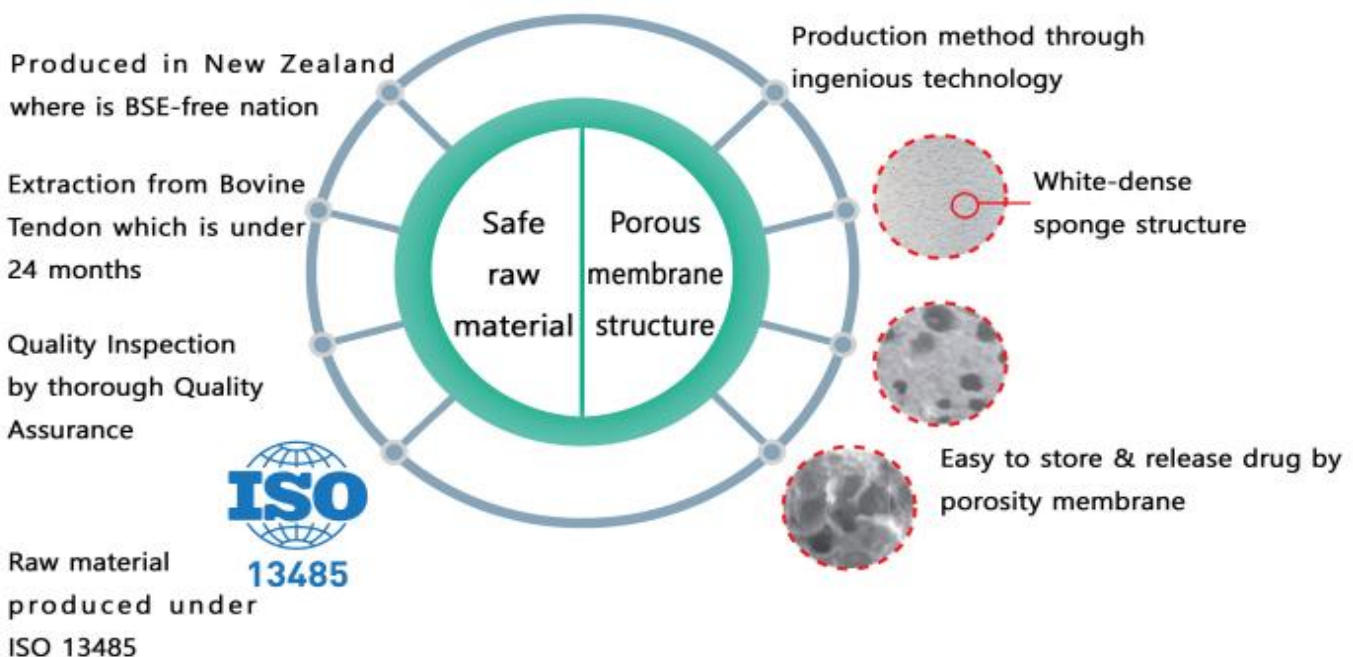


# Collagen Putty Type

## Main Features

- Mesoporous calcium phosphate bone graft material with 'Inter-linked Macro / Micro porous structure'
- Composition : 60% Hydroxyapatite / 40%  $\beta$ -Tricalcium phosphate (BCP : Biphasic Calcium Phosphate)
- Trabecular structure similar as human body cancellous bone & stable bone absorption to the interior of the body
- Blood vessel growth & osteoblast movement by linked Macro porous
- High autogenous bone occupancy ratio (about 80% porosity ratio -> about 80% autogenous bone occupancy ratio)
- Micro pore structure on bone surface is very favorable structure for osteoblast cohesion
- Optimized scaffold for 'bone-tissue engineered' bone regeneration
- Excellent biocompatibility to human body
- Excellent cell regeneration & adhesion
- Bone cell regeneration effect
- Good usability (easy for formation)
- Size of Particle : 1 ~ 2mm

## Benefit in raw material & structure



## Result for 3month specimen. - Micro Computed Tomography

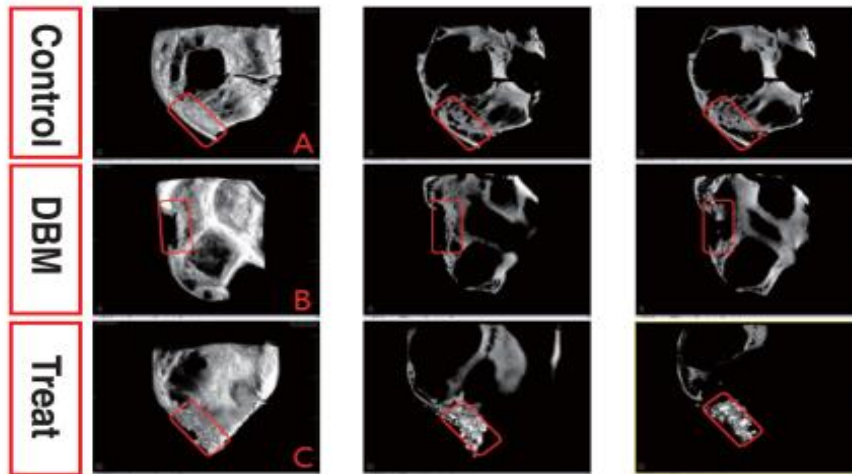


Fig. 1 (A) The  $\mu$ CT image of specimen with only defect and bone defects is indicated by red box. (B) a  $\mu$ CT image of specimen grafted DBM on defect and it is indicated by red box. (C) a  $\mu$ CT image of specimen grafted collagen putty on defect and it is indicated by red box. The control group showed a lot of healing in the cortical bone, but there were empty spaces in the trabecular bone. However, the treat group is more healed in cortical and trabecular bone healing than the others.

< S대학병원 연구 결과 >

## Result for 3month specimen. - Micro Computed Tomography

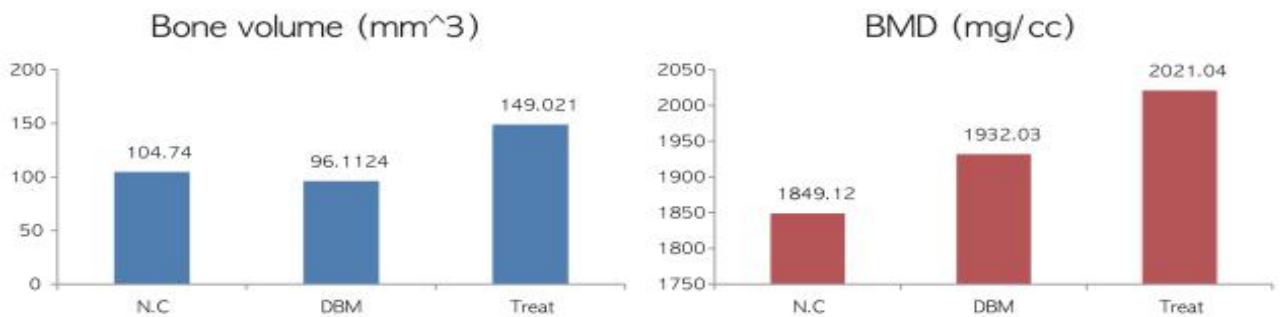
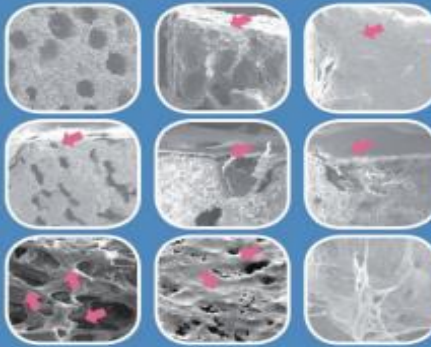


Fig. 2 The following are the Bone Mineral Density (BMD, mg/cc) and bone volume for each sample. Negative control = 1849.12, 104.74, DBM group = 2021.04, 149.021, Treat (grafted Collagen putty) 1932.03, 96.1124

	Bone volume (mm <sup>3</sup> )	BMD (mg/cc)
N.C	104.74	1849.12
DBM	96.1124	1932.03
Treat	149.021	2021.04

# Interconnected Macro / Micro pore system

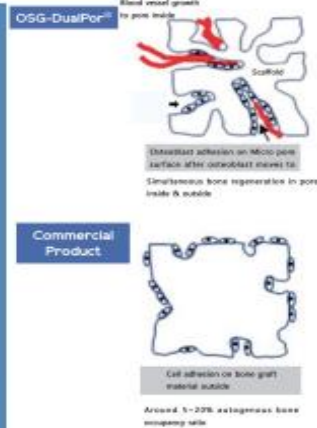
## Cell culture behavior



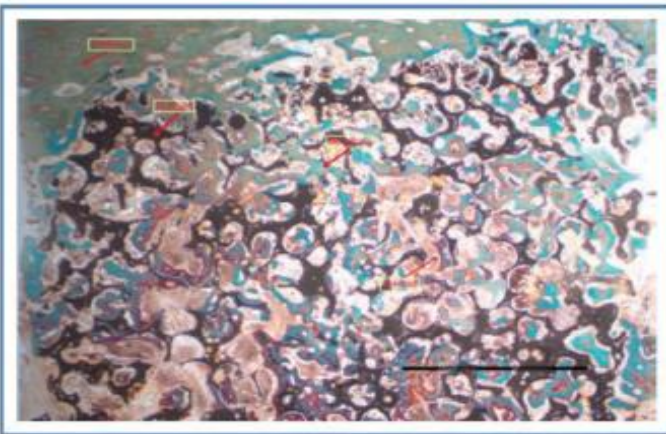
**A company (US)**  
Osteoblast adhesion only on bone graft material outside by closed pore  
No osteoblast in closed pore inside

**B company (US)**  
Osteoblast adhesion only on bone graft material outside by closed pore  
No osteoblast in closed pore inside

**OssGen company (KR)**  
Homogenous osteoblast adhesion along endoskeleton by 'Inter-linked' open pore structure  
New bone occupancy ratio: 80% (Much higher)



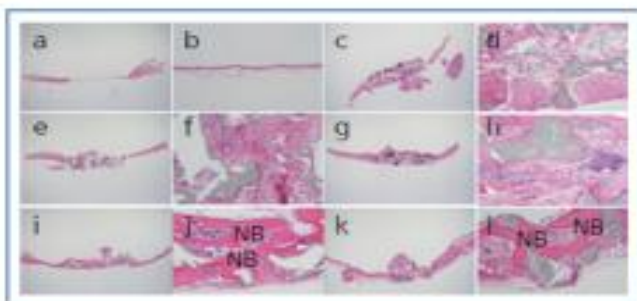
## In-vivo Histology



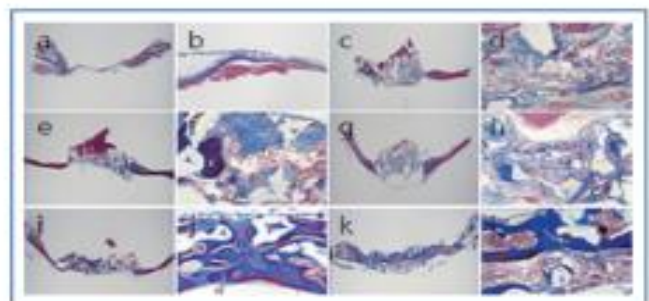
- Beagle dog model (6 month)
- Old bone (Upper left)
- Bone graft material (Brown color)
- New bone (Blue color)
- Osteoid (Ivory color around bone graft material)
- 80% porosity ratio of bone graft material -> 80% autogenous bone occupancy ratio (Higher among products in the inside and outside of the country)
- Simultaneous & homogeneous bone regeneration of bone graft material inside & outside through blood vessel growth & osteoblast movement to the inside of Macro/Micro porosity

## Collagen Putty Type with Tissue Engineering

Courtesy of Prof. E. Park, KNU



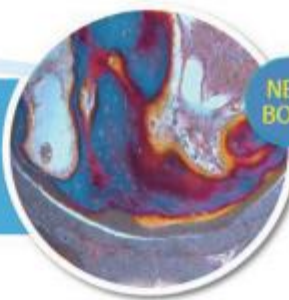
Immunohistochemical analysis of new bone at 10 weeks after surgery (New bone formation measured by H&E staining) (a, b) : defect only, (c, d) BCP only, (e, f) BCP+ATSC, (g, h) BCP+BMSC, (i, j) : BCP+ATSC+VEGF, (k, l) : BCP+BMSC+VEGF, \* NB : New bone



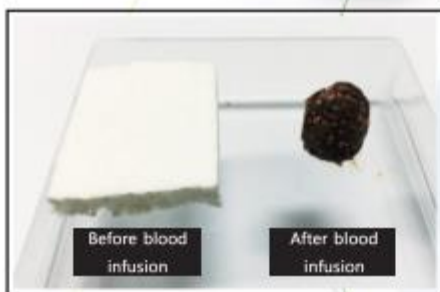
Immunohistochemical analysis of new bone at 10 weeks after surgery (New bone formation measured by masson's Trichrome staining) (a, b) : defect only, (c, d) BCP only, (e, f) BCP+ATSC, (g, h) BCP+BMSC, (i, j) : BCP+ATSC+VEGF, (k, l) : BCP+BMSC+VEGF, \* collagen matrix formation



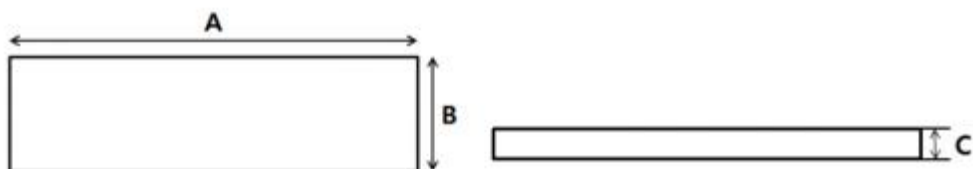
Excellent bone synostosis  
between bone graft  
material & new bone  
(Osseointegration)



NEW  
BONE



Easy to mold when the  
patient's blood infusion



For Or tho- pe- dics	No	Model Name	Width	Length	Thickness	Weight
	1	DualPor Collagen Putty 1	1	1	0.5	0.257
	2	DualPor Collagen Putty 3	3	2.8	0.5	2.0
	3	DualPor Collagen Putty 5	5	2.8	0.5	2.80
	4	DualPor Collagen Putty 7	7	2.8	0.5	4.02
	5	DualPor Collagen Putty 10	10	2.8	0.5	5.37