

Development of new artificial bone (Comporus™) as scaffolds for effective reconstruction of large bone defects

Dr Y. Shikinami (Medical Div, Takiron Co., Ltd.) and Prof. Dr. T. Nakamura (Department of Orthopaedic Surgery, Kyoto University Hospital) press-released (2008/7/25) the development of new artificial bone as scaffolds for effective reconstruction of large bone defects, which can be intraoperatively transformed and trimmed to implant close-fittingly in the cubic shape of large defects, and accelerate the osteoinductive effect in addition to the osteoconductive behavior.

There have been investigated a great number of temporary scaffolds for tissue regeneration and shape reconstruction to the large bone defects remaining after extracting large foci. However, existing porous ceramic scaffolds are generally very brittle and easily crack and break off, therefore, they have no capability for trimming and transforming. In addition, they don't accelerate osteoinductivity but only osteoconductivity.

Namely, ideal scaffolds to fulfill all of characteristics listed up as follows have never been developed as yet.

- 1) To possess the potentiality to accelerate osteoinduction in addition to osteoconduction
- 2) To complete tissue regeneration and bone reconstruction preferably within a year, meanwhile the scaffolds degrade and disappear from the living body with displaying good biocompatibility
- 3) To be able to transform and trim intraoperatively in order to coincide with the cubic shapes of bone defects.
- 4) To have mechanical strengths similar to cortical bone (compressive strength; 5~10 MPa)

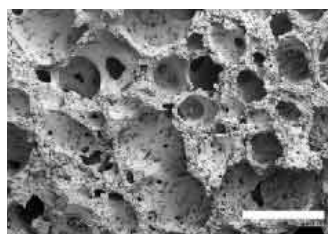
The members of Kyoto University have assessed its clinical availability through the *in vivo* animal test of Comporus™ that Takiron had fabricated several years ago. It was demonstrated that Comporus™ provides these characteristics and the results have been reported in several Scientific Conferences and published in Biomaterial Journals.

Comporus™ is a composite consisting of a 75wt% (about 50vol%) of poly D/L-Lactide and a 25wt% of bioresorbable hydroxyapatite (u-HA) particles (average diameter; 3~5 μ m) and has the porous construction with more than 70% of interconnective pores. The compressive strength is about 5MPa nearly equivalent to the cortical bone and the total materials will be resorbed within 1 year while replacing with natural bone. Comporus™ can be clinically used in not only orthopaedic, traumatic indications but also the maxillofacial, plastic and reconstructive surgeries.

Comporus™ received FDA 510K clearance (K062629, April, 2008), and Takiron is now preparing for industrial production and selling to the USA market on and after April, 2009.



Comporus™



Magnified Pores



Trimming



Transformed



Implanted in a bone defect

