Kyung-Hwan, kwon, DDS, MSH, PhD.

Professor
Director of Oral and Maxillofacial surgery
Director of Wonkwang dental hospital
Dept. of Oral and maxillofacial Surgery
College of Dentistry, Wonkwang University

School of Dentistry, Wonkwang university
344-2 Shinyoungdong Iksan city, Chollabuldo, South Korea
TEL (82) 63-859-2900
FAX (82) 63-857-4002

Education
1996: DDS, Wonkwang University, School of Dentistry, Korea
2000: MD, Wonkwang University, School of Dentistry, Korea
2007: PhD, Chunnam Univesity, Postgraduate school, Korea.

Postgraduate Training
Internship of Wonkwang University Dental Hospital, Korea
Residency of Department of Oral and Maxillofacial Surgery, Wonkwnag University Dental Hospital, Korea

Positions Held & Faculty Appointment
Feb. 1999 – Mar. 2002 : Korean Army, Captian, Republic health hospital
2016 present Professor/ Director of Wonkwang Dental hospital
2016 present Member of Korean Association of Oral &Maxillofacial Surgeons.
and Public relation director
2016 present Member of Korean Academy of maxillofacial Plastic& Reconstructive Surgery.
and Insurance director

Three-Dimensional Prining of rhBMP-2-Loaded LFA Collagen Scaffold with Long Term Delivery for Enhanced Bone Regeneration.

Dept. of Oral and Maxillofacial Surgery
College of Dentistry
Wonkwang University

Kyung-Hwan, Kwon

Three-Dimensional printing-based scaffolds have demonstrated a remarkable potential for bone formation, regeneration and healing. Research interest in 3D printing-based scaffold is now focused on how to functionalize the scaffolds to accelerate the bone healing process. Recombinant human bone morphogenetic protein-2(rhBMP-2) is recognized as the most potent powerful osteoinductive ability. The rhBMP-2, which is clinically approved by the FDA, KFDA, has been used for various clinical application such as open fracture of mandible, osteomyelitis and osteonecrosis. Despite its efficacy, it has been reported that sustained and local delivery of rhBMP-2 using a suitable carrier is essentially required to accelerated bone healing.

Recently, a variedty of sustained rhBMP-2 delivery systems based on 3D printing technology have been introduced. The 3D printing-based collagen scaffold was immersed into rhBMP-2 solution for a delivery system. However, the dipping method could cause inconsistent loading quantity of rhBMP-2 in the scaffold and a waste of rhBMP-2 exceeding the amount necessary. We developed a 3D printing-based rhBMP-2 delivering scaffold only clinically relevent biomatrials and processes using a multi-head deposition system(MHDS).

We have studied Lidocaine-Fibrinogen-Aprotinin(LFA) collagen scaffold loaded rhBMP-2 in 3D printing-based tissue engineering system. Biphasic release of rhBMP-2 could continue for more than 21 days, and keep its osteoinductivity to induce osteogenic differentiation of bone cells. Especially, LFA collagen scaffold system can simultaneously achieve localized ling-term controlled relase of rhBMP-2 and bone regeneration, which provideds a promising route for improving the treatment of bone defects and bone diseases(osteomyelitis, BRONJ, MRONJ, osteoradionecrosis etc.)