

## **Covalent Receives Merit Award from Minister of Economy, Trade and Industry for Collaborative Achievement Between Industry, Academia and Government**

Covalent Materials, with Osaka University and MMT Co., Ltd., is the recipient of the Twelfth Annual Merit Award from the Minister of Economy, Trade and Industry for Collaborative Achievement Between Industry, Academia and Government for the product NEOBONE, a bone graft substitute which was developed and commercialized through a joint effort.

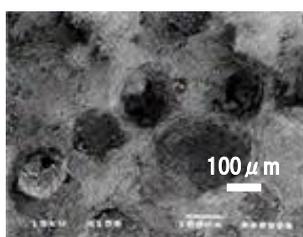
The award, which has been conferred by the Cabinet Office of Japan annually since 2003, recognizes people who have collaborated between universities, public research institutes and industry to establish leading projects that result in significant contributions at the national level. In particular, contributors to the scientific and technological development of mining and manufacturing are acknowledged.

The reception of this award commends the joint development and commercialization of a bone graft substitute. In this case the bone graft substitute was developed to promote bone strength and structural growth by utilizing existing technology at a university, then applying technology from a different field to further develop the material, resulting in a more effective product.

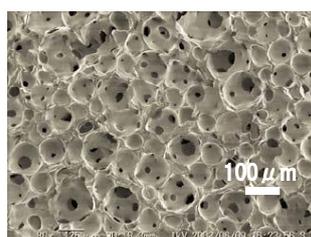
Considerations in the development of the bone graft substitute were that it be “easy to work with in a surgical operation and have strength after implantation” and that it be “used easily with the patient’s own bone tissue.” A research team led by Dr. Akira Myoui at Osaka University contacted Covalent Materials about the development of a bone graft substitute after noticing Covalent’s porous ceramic material, a multi-pored hydroxyapatite, which was originally developed for cleaning semiconductor substrates and which was made using the company’s proprietary foaming technique.

The result was the successful development of NEOBONE, the first bone graft substitute that allows bone growth to easily penetrate the bone graft substitute’s structure while promoting bone strength. Since NEOBONE is a manmade material, special shapes can be made. Furthermore, the introduction of human bone marrow stem cells into the material has advanced the technology of bone generation. NEOBONE’s rapid bone growth can help reduce hospital stays and rehabilitation times, thereby alleviating the physical and mental stress experienced by patients of bone replacement and leading to a quicker return to normalized life.

At present, NEOBONE is being developed into an even stronger material and its applications are being expanded into the dental field.



In conventional ceramic bone fillers, there are few pores and they do not interconnect.



NEOBONE’s interconnecting pore structure does not need many small pores, which can cause the product to be fragile.

### Award details:

Award title: Twelfth Annual Merit Award from the Minister of Economy, Trade and Industry for Collaborative Achievement Between Industry, Academia and Government.

Project: Development and commercialization of a bone graft substitute that builds bone strength and promotes structural bone growth.

Recipients: Medical Center for Translational and Clinical Research, Osaka University Hospital, Dr. Akira Myoui, Vice Director

Covalent Materials Corporation, Precision & Functional Materials Division, Hatano Facility;  
Koichi Iimura, Manager, Bio Ceramics Products

MMT Co., Ltd., Osamu Masaki, Representative Director & President