PRESS RELEASE

VascuBone – a toolbox for customised vascularised bone implants

The EU project VascuBone, coordinated by the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, has reached a successful conclusion. In late March, the partners of this international research consortium met at the Würzburg Congress Centre to discuss the results of this five-year project. The focus of the meeting was the new VascuBone "toolbox" that makes it possible to perform advanced, individualised bone implants.

The final meeting of the EU project VascuBone took place on 30 and 31 March 2015 in the Würzburg Congress Centre. The goal of this project was to improve bone implants to minimize the risk of rejection while supporting the body's own regenerative powers and promoting new bone growth. At the end of the final stage of more than five years of funding, the international consortium and invited guests met to evaluate the results in terms of the original project goals.

The results of the multi-year project included the VascuBone "toolbox" for bone regeneration. This toolbox provides the various components required for a customised bone implant that supports the body's own self-healing capacity when alone it cannot meet the regenerative needs following severe damage or injury. Until now, surgeons have used either metal-based implants or tissue transplanted from a patient's own pelvic bone. "There are drawbacks to both options: metal remains a foreign substance on the surface of which new bone cannot form. Tissue from a patient's pelvis would be ideal but there is a limit to how much can be removed", explained VascuBone project coordinator Heike Walles. The biologist is professor of Tissue Engineering and Regenerative Medicine at the Würzburg University Hospital and Director of the Translational Centre "Regenerative Therapies for Cancer and Musculoskeletal Diseases" of the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB's Würzburg branch.

The VascuBone project involved 19 partners from four countries working together to develop an alternative solution that could improve bone implants. The newly developed toolbox now makes it possible to create tailor-made vascularised bone implants that can be used to treat both smaller defects and more serious injuries. The toolbox comprises three different components. The basis is a novel diamond-coated ceramic granulate material with large pores. This material can be readily used as it is easily absorbed in humans, is biocompatible and facilitates the growth of bone cells. The second component is made up of proteins acquired from the patient's own blood that help promote bone tissue growth. The final component consists of cells from the patient's blood or spinal column that ensure that the implant is not rejected.

The researchers were already able to demonstrate in pre-clinical trials that the bone implants did not accelerate the growth of tumours. Various tests also showed that the implants were also ideal for regenerating bone that is weakened with age. Clinical trials are now underway that will allow the use of the implants in patients within a few years.

The project partners used the meeting to bring together the scientific findings regarding the implant construction and individual functionalisation with autologous cells and proteins. Quality control measures that have been implemented and the associated studies and tests were then presented. The first day concluded with a summary and evaluation of the project results. The focus of the second day was future perspectives of the research. The relevance of tissue engineering was highlighted both from an industrial perspective and in terms of scientific research.

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