

Growing new bone for more effective injury repair

March 9 2017



Credit: AI-generated image ([disclaimer](#))

Broken bones do not always repair fully, especially after major trauma such as a car accident. Complications can occur when the bone is broken in several places, the blood flow is reduced or infection sets in. Patients can suffer long-term from loss of income and disability.

There is significant demand for [bone regeneration](#). Bone is the second most frequently transplanted tissue in Europe after blood, with about 1 million procedures annually. The worldwide market of bone replacement material is currently estimated at EUR 5 billion and is growing by 10 % each year.

Grown from previous research

EU-funded researchers have designed a new combination of stem cells and biomaterial that grows new bone where fractures have failed to heal. The ORTHOUNION project will now run clinical trials to test the treatment with patients from across Europe.

The clinical trials will further test the method developed by the previous EU-funded research project REBORNE that ran from 2010 to 2015. In this project researchers defined a combination of stem cells and the bone substitute biomaterial, biphasic calcium phosphate. Specifically, [mesenchymal stem cells](#) (MSCs) are extracted from the patient's own [bone marrow](#) and multiplied outside the body. These cells of connective tissue can differentiate into a variety of cell types, including [bone cells](#). Results from initial trials were very encouraging.

The ORTHOUNION trials will compare the effectiveness of the REBORNE combination with a graft of bone taken from the patient's pelvis, to treat fractures of long bones in the arm or leg. Transplanting bone from elsewhere in the patient's body is currently the most common treatment for [bone](#) defects, but the amount of tissue is limited and complications may occur. Bone grafts from a tissue bank are an alternative, but bring a risk of infection or rejection by the immune system.

By running large-scale comparative trials, ORTHOUNION will test the safety and effectiveness of the new biomaterial in treating complex

injuries. Patients in twenty hospitals in France, Germany, Italy and Spain will participate in the trial, coordinated over five years by the Universidad Autonoma de Madrid. The EUR 6 million project is funded entirely by the EU.

The project will further understanding of [stem cells](#) and tissue engineering in regenerative medicine – a growing field of medical innovation that offers hope to patients for more effective treatment.

More information: REBORNE project website: www.reborne.org/

ORTHOUNION project page on Cordis:
cordis.europa.eu/project/rcn/207447_en.html

Provided by CORDIS

Citation: Growing new bone for more effective injury repair (2017, March 9) retrieved 27 April 2024 from <https://medicalxpress.com/news/2017-03-bone-effective-injury.html>

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