

Implants make light work of fixing broken bones

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Artificial bone, created using stem cells and a new lightweight plastic, could soon be used to heal shattered limbs.

The use of bone stem cells combined with a degradable rigid material that inserts into [broken bones](#) and encourages real bone to re-grow has been developed at the Universities of Edinburgh and Southampton.

Researchers have developed the material with a honeycomb scaffold structure that allows blood to flow through it, enabling stem cells from the patient's bone marrow to attach to the material and grow new bone. Over time, the plastic slowly degrades as the implant is replaced by newly grown bone.

Scientists developed the material by blending three types of plastics. They used a pioneering technique to blend and test hundreds of combinations of plastics, to identify a blend that was robust, lightweight, and able to support bone [stem cells](#). Successful results have been shown in the lab and in animal testing with the focus now moving towards human clinical evaluation.

The study, published in the journal [Advanced Functional Materials](#), was funded by the Biotechnology and Biological Sciences Research Council.

This [new discovery](#) is the result of a seven-year partnership between the University of Southampton and the University of Edinburgh.

Richard Oreffo, Professor of Musculoskeletal Science at the University of Southampton, comments: "Fractures and bone loss due to trauma or disease are a significant clinical and socioeconomic problem. This collaboration between chemistry and medicine has identified unique candidate materials that support [human bone](#) stem cell growth and allow [bone formation](#). Our collaborative strategy offers significant therapeutic implications."

Professor Mark Bradley, of the University of Edinburgh's School of Chemistry, adds: "We were able to make and look at a hundreds of candidate materials and rapidly whittle these down to one which is strong enough to replace bone and is also a suitable surface upon which to grow new bone.

"We are confident that this material could soon be helping to improve the quality of life for patients with severe bone injuries, and will help maintain the health of an ageing population."

Provided by University of Southampton

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