

# Researchers use a 3D printer to make bone-like material (w/ video)

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It looks like bone. It feels like bone. For the most part, it acts like bone. And it came off an inkjet printer.

Washington State University researchers have used a 3D printer to create a bone-like material and structure that can be used in orthopedic procedures, dental work, and to deliver medicine for treating osteoporosis. Paired with actual bone, it acts as a [scaffold](#) for new bone to grow on and ultimately dissolves with no apparent ill effects.

The authors report on successful in vitro tests in the journal *Dental Materials* and say they're already seeing promising results with in vivo tests on rats and rabbits. It's possible that doctors will be able to custom order replacement [bone tissue](#) in a few years, says Susmita Bose, co-author and a professor in WSU's School of Mechanical and Materials Engineering.

"If a doctor has a CT scan of a defect, we can convert it to a CAD file and make the scaffold according to the defect," Bose says.

The material grows out of a four-year interdisciplinary effort involving chemistry, materials science, biology and manufacturing. A main finding of the paper is that the addition of silicon and zinc more than doubled the strength of the main material, [calcium phosphate](#). The researchers also spent a year optimizing a commercially available ProMetal [3D printer](#) designed to make metal objects.

The printer works by having an inkjet spray a plastic binder over a bed of powder in layers of 20 microns, about half the width of a human hair. Following a computer's directions, it creates a channeled cylinder the size of a pencil eraser.

After just a week in a medium with immature human [bone cells](#), the scaffold was supporting a network of new bone cells.

Provided by Washington State University

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