

# Novel Biodegradable and Non-biodegradable 3D Printed Implants

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## Technology description

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Musculoskeletal diseases are the second most common cause of disability with cost to the healthcare industry in upwards of \$5 billion per year. Current implants designed to treat these diseases are plagued by various complications including infection, immune rejection, and inadequate osteointegration. New technologies are needed to overcome these complications to provide better quality of care and decrease financial burden. This invention describes 3D printed biocompatible implants and fixation devices that can be permanent or bio-degradable. They can elute drugs and antibiotics, over a period of days or months to prevent infection. The invention has the potential to alleviate many of the issues with current implants by increasing osteointegration, preventing infection, and reducing costs.

### Opportunity

The US market orthopedic implants exceeded \$5 billion in 2015 with the aging population as the main driver of growth. This cost is expected to double by 2024. The market for 3D printing is also expanding with revenue expected to exceed \$13 billion in 2018 with approximately 13% attributed to 3D printed medical devices.

## Application area

This 3D implant technology is made with biocompatible polymers that are safe, anti-corrosive and resistant to rejection. They are custom designed to fit patients of all sizes, can elute various drugs to prevent infection and are printed within a few hours of the patient visit. The treatment of musculoskeletal diseases requiring implants or fixation devices including but not limited to elastic nails, clavicular plates, tibia and femoral nails, interlocking plates and knee and hip replacements.

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