“A Novel Flexible Fracture Fixation Plate for Long Bone Healing”

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This work proposes a novel, single-piece bone plate that can provide controlled axial flexibility (Axi-FLEX™) for facilitating healing in long bone fractures. Up to 18% of long bone fractures result in non-union, resulting in *additional* total care costs of up to $68,000/patient and over $1.2B total in the U.S. each year. While traditional rigid plates can perform well for simple fractures, they have consistently been shown to be too stiff for complex or multi-fragmented fractures.

The Axi-FLEX™ implant is a flexible bone plate for fractures of long bones such as the humerus, femur, and tibia. As patients begin to move around and weight-bear after surgery, precisely designed flexible elements in the plate compress and expand elastically, delivering motion between bone fragments while still protecting the fracture from excessive loads. The plating system is the first to offer increased flexibility while being made of a single piece of stainless steel, a surgeon-preferred material that is generally too stiff to promote callus formation.

This work includes a summary of biomechanical simulation results, analytical modeling of the flexible elements in the plate, the business model for the technology, market and competitor analysis, and future commercialization plans with the technology.