

# POLYUSTIMULATOR – ULTRASOUND DRIVEN PIEZOELECTRIC STIMULATOR FOR NEUROMUSCULOSKELETAL REHABILITATION



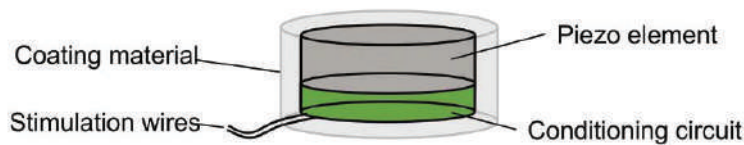
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As existing electroceutical stimulators are bulky with limited life span and poses transmission efficacy and safety concerns, wireless power delivery to electrical implants deep inside the body remains a critical challenge. The PolyUStimulator presents a battery-free, ultrasonically-powered, piezoelectric stimulator for functional muscles, nerves and bones. Ultrasounds can reach deep into the body where conventional inductive energy cannot reach safely; it is also safe from radio frequency interference; and is fully MRI and X-ray compatible. This innovation can treat patients, ranging from neurological to orthopedic conditions, whom are paralyzed or suffering from non-union bone fractures or neuromusculoskeletal pain.

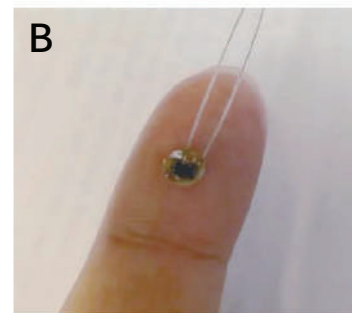
## NOVEL FEATURES

- \* Tiny (injectable), wireless implant to provide electroceutical treatments, **non-surgical**
- \* The implant converts ultrasound energy into piezoelectric stimulation current, **battery-free**
- \* Ultrasounds can reach deep into the body where conventional inductive energy cannot reach safely, **anywhere**
- \* Ultrasound is also safe from RF and other interferences, **safe**
- \* Fully MRI and X-ray compatible, **ubiquitous**

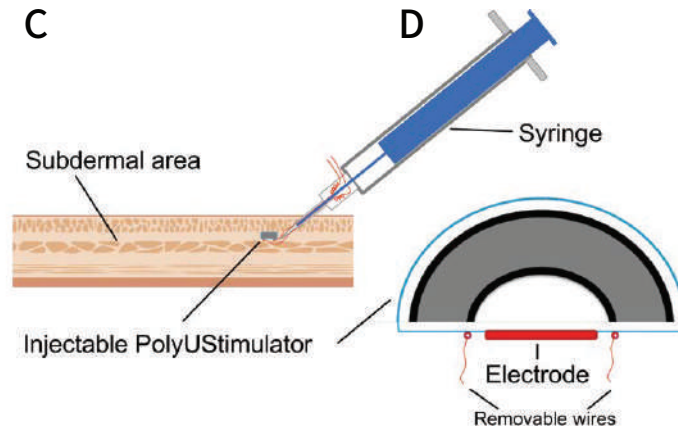
A



B



C



- ▶ A. Design Components
- B. Prototype of the PolyUStimulator
- C. Implantation technique (patented) of the PolyUStimulator via a custom injection at the sub-dermal area
- D. Cross-section view of the injectable PolyUStimulator

