

***Modulation of acute and chronic pain using focused ultrasound on the peripheral nervous system***

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Poorly controlled acute and chronic pain are common, and inadequate pain control increases the risk of numerous medical complications. Innovative, safe, and effective methods to improve and prevent acute and chronic pain are needed. Focused ultrasound (FUS) can change central and peripheral nervous system structures, including altering nerve conduction, similar to local anesthetics. However, no work has yet been published assessing its effects on acute or chronic pain. Our long-term objectives are to use FUS as a non-invasive nerve block technique to improve acute pain and reduce the risk of chronic pain after surgery. The reversibility and differential blockade of different classes of nerve fibers by FUS will be examined. Additionally, FUS's effects on acute pain and the development of chronic pain will be tested in a rodent model. Focused ultrasound has the potential to dramatically improve both acute and chronic pain, decreasing the need for opioid pain medications.