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Methods for Treating Central Pain Syndrome and Other Pain Related Pathologies

Key Investigator
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Field
Neurological disorder
Pain management

Technology
Central pain syndrome treatment

Advantages
Alleviate chronic pain without use of pharmaceutical treatments

Status
Available for licensing

Patent Status
U.S Patent 8,396,558

UMB Docket Reference
AK-2009-044

External Reference
Outside References here

Summary
Central pain syndrome (CPS) is a debilitating condition affecting with lesions or dysfunction in the central nervous system. CPS is a neurological disorder resulting from damage to or dysfunction of the pain-conducting pathways of the central nervous system. The patented invention describes a novel method for treating CPS regions of the brain comprising the zona incertia (ZI).

Market
CPS is a common condition exhibited by patients suffering spinal cord injuries, multiple sclerosis (MS), epilepsy, Parkinson's disease, and cerebrovascular lesions (stroke). It is estimated that as much as 95% of spinal cord injury patients, 30% of MS patients, and approximately 10% of stroke patients will suffer from CPS. In the U.S. alone, it is estimated that nearly four million people will suffer from neuropathic pain. Treatment of CPS includes the use of pain medications, tricyclic antidepressants, and anticonvulsants. Complete relief of pain is often not possible.

Technology
The invention describes a method of controlling pain in CPS patients that involves the implantation of electrodes in the sub-thalamic nucleus zona incerta. A patient-controlled stimulator using radio-frequency waves is used to stimulate the ZI. The researchers have shown that one of the causal pathological events leading to CPS is abnormally suppressed activity of the inhibitory ZI. The ZI is responsible for regulating the activity of thalamic nuclei that process pain information. The stimulation of the ZI results in immediate and complete amelioration of pain sensations.

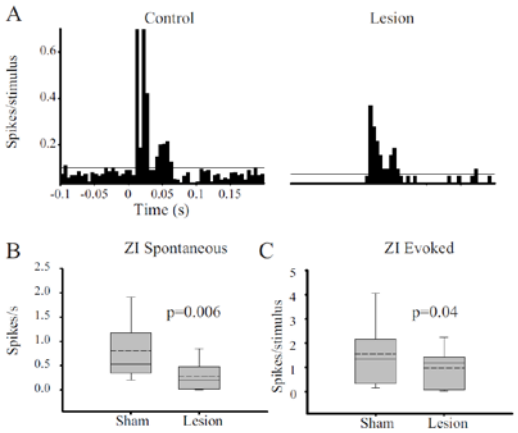

Figure 1: Spinal lesions result in suppression of spontaneous and sensory-evoked response of ZI neurons. A. peri-stimulus time histogram demonstrates spontaneous and sensory-evoked activity in a ZI neuron in lesioned rat are markedly lower than in a control neuron. B. Significant decrease in spontaneous in animals with CPS when compared to sham-operated controls. C. Stimulus evoked activity of ZI neurons from CPS rats when compared to with sham-operated controls.

Technology Status
The efficacy of the technology to control CPS has been demonstrated in appropriate animal models.

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