

# Closed-loop Sacral Nerve Stimulation for Inflammation

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## Technology description

### Unmet Need:

About 5%-7% of general population in Western society is affected by immune-mediated inflammatory diseases that include, but not limited to, ankylosing spondylitis, psoriasis, psoriatic arthritis, rheumatoid arthritis, and inflammatory bowel disease (IBD) (includes Crohn's disease and ulcerative colitis). The prevalence of inflammatory diseases is even higher in the veterans' population due to frequent exposures to stress. Although these diseases have different epidemiologies and pathophysiologies, they have one thing in common: an imbalance in inflammatory cytokines. Further, a cholinergic anti-inflammatory pathway has recently been implicated and animal studies have shown a preventive effect of vagal nerve stimulation (VNS) on inflammation in the gut and a recent clinical study has demonstrated a therapeutic role of VNS for rheumatoid arthritis.

### Technology Overview:

JHU inventors propose a novel method of closed-loop sacral nerve stimulation for the treatment of inflammation. In this method sacral nerve is electrically stimulated and its stimulation parameters are automatically adjusted based on the measurement of autonomic function.

The novel method includes:

- 1) application of sacral nerve stimulation for treatment of inflammation;
- 2) feedback-controlled mechanisms in automatically adjusting stimulation output;
- 3) special stimulation parameters suitable for treating inflammation

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