

Effect of Epidural Kilohertz Frequency Spinal Cord Stimulation on Lower Urinary Tract Function in a Rat Spinal Cord Transection Model

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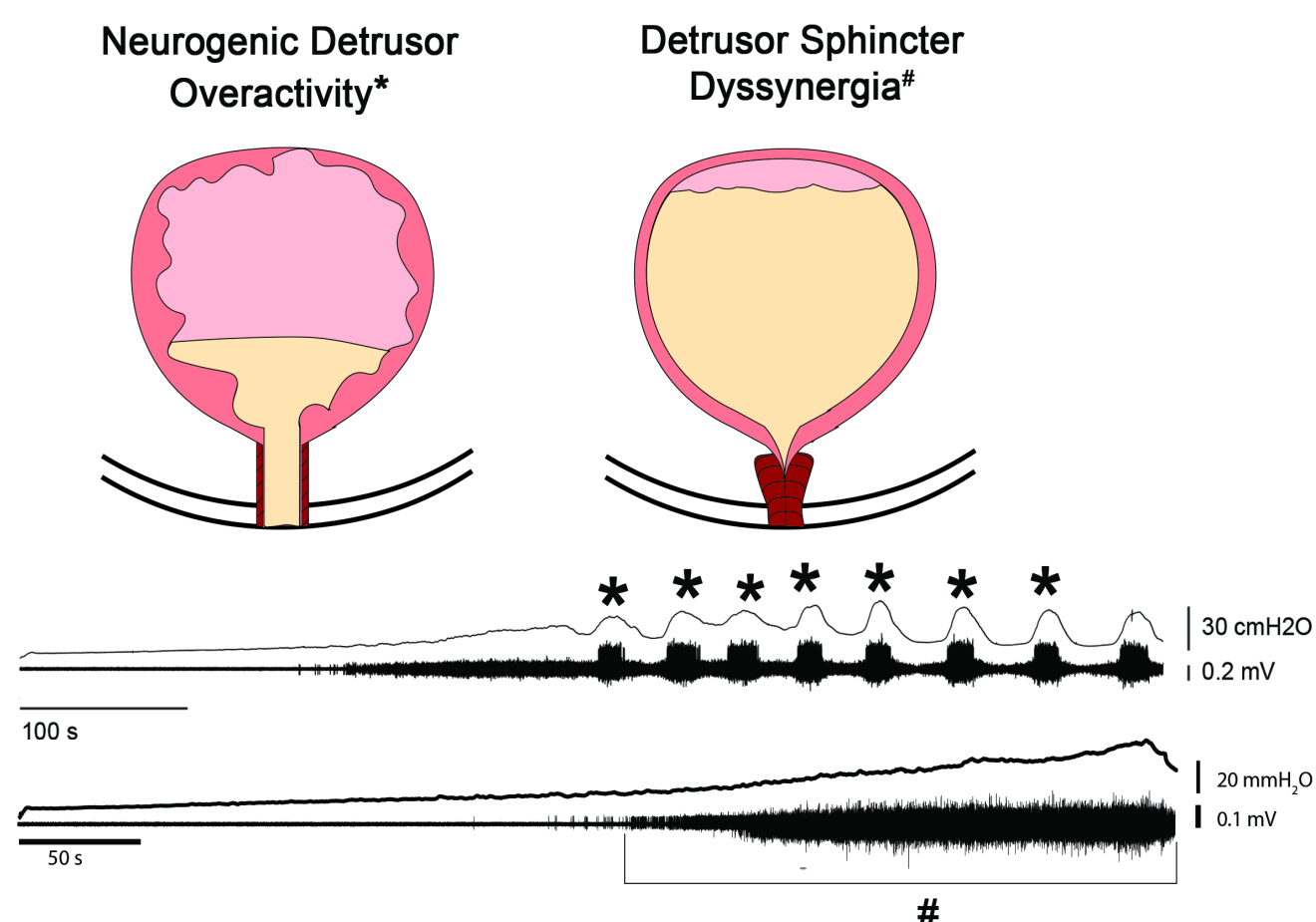


Introduction

Spinal cord injury (SCI) results in bladder dysfunction¹

Epidural kilohertz frequency spinal cord stimulation (KHF SCS) modulates lower urinary tract function in intact rats²:

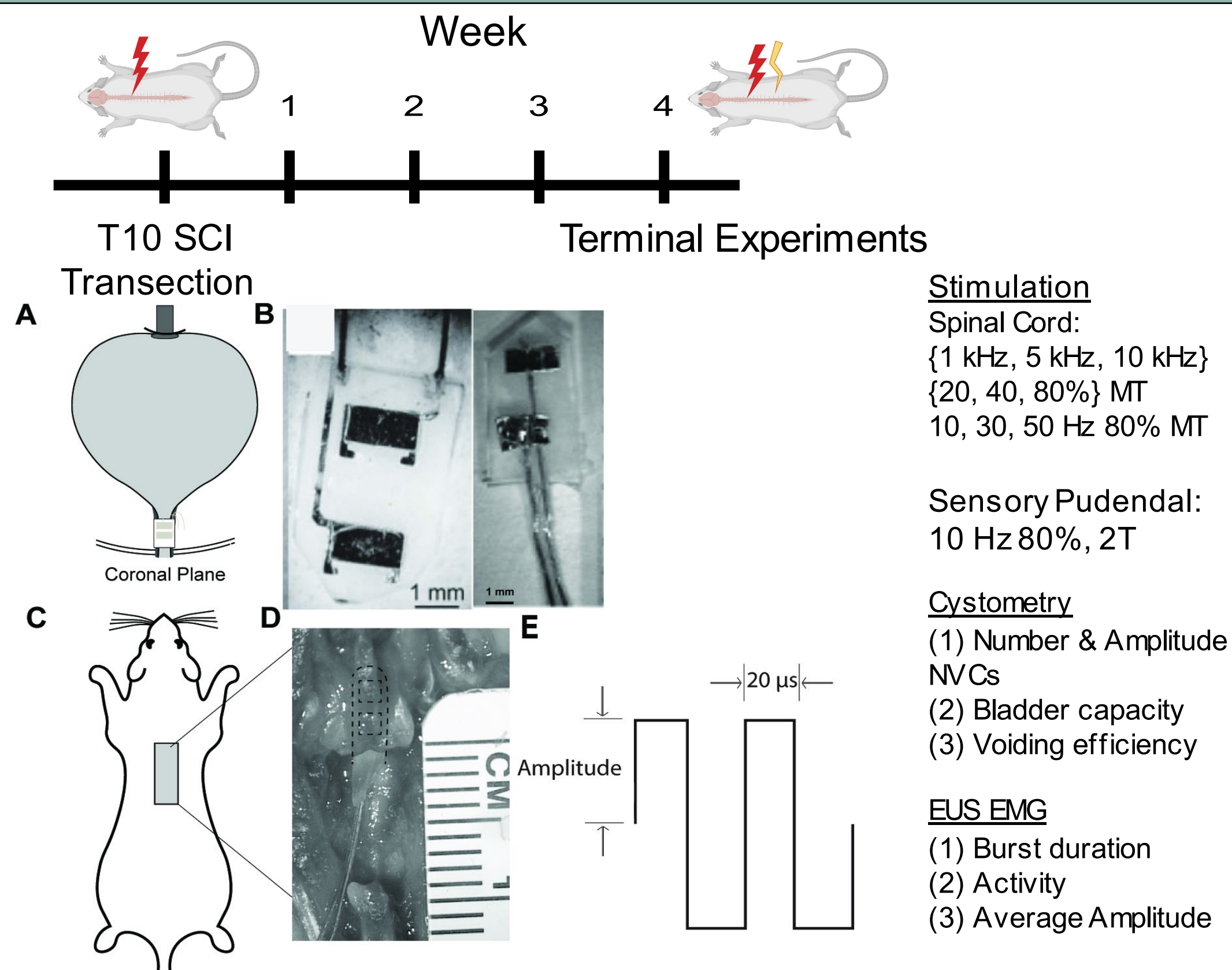
Intact → Increases in bladder capacity, voiding efficiency, and external urethral sphincter (EUS) EMG
Hypersensitive → Increases in voiding efficiency and EUS EMG amplitude + Decreases in the number of non-voiding contractions



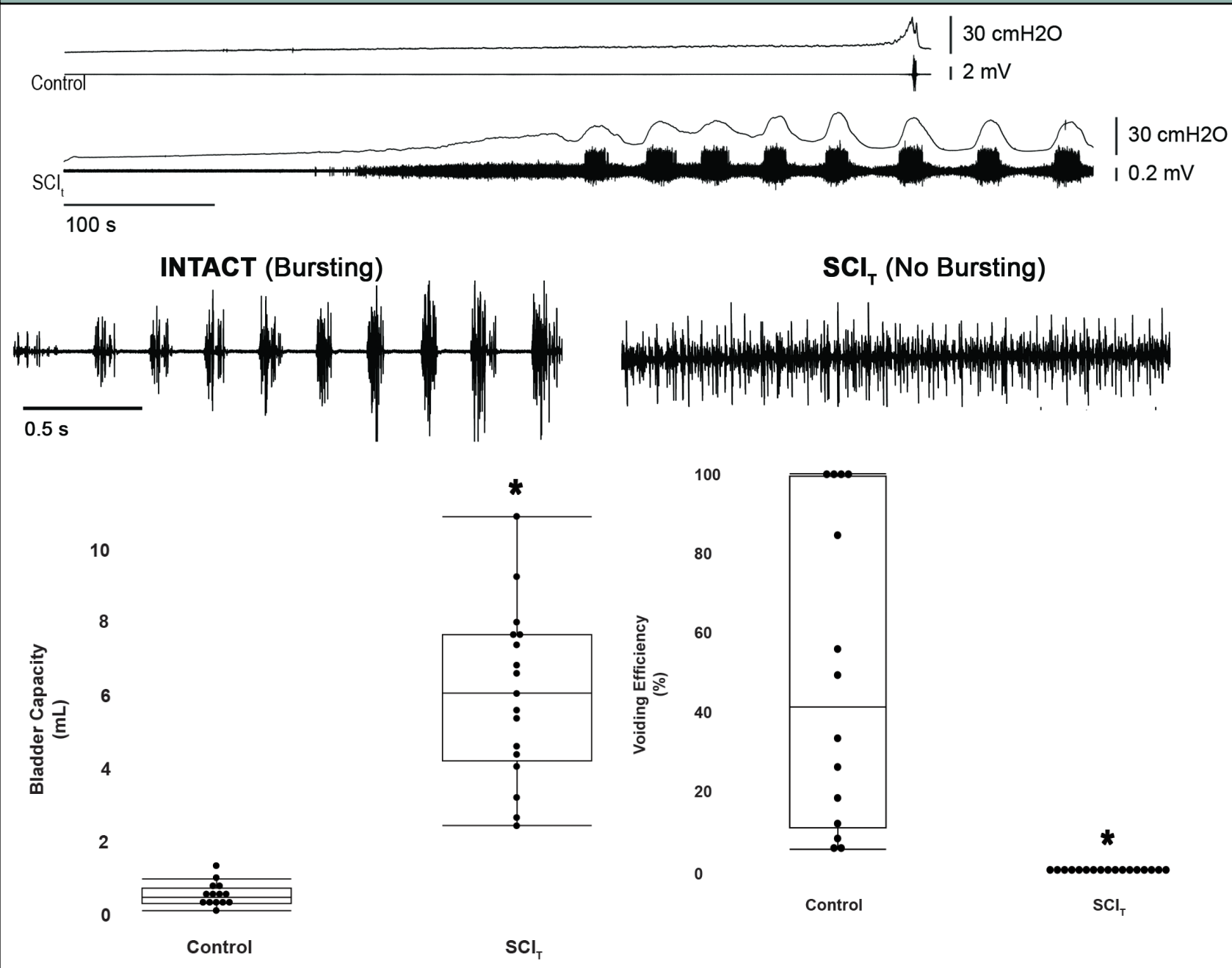
Hypothesis:

KHF SCS will ameliorate bladder dysfunction following SCI

Methods



Transection SCI Disrupts Bladder Function



Summary

After SCI:

Tonic EUS activity causes *increased* bladder capacity, non-voiding contractions, and *decreased* voiding efficiency.

KHF SCS *decreases* **tonic EUS activity** allowing for *decreases* in **bladder capacity, non-voiding contractions, and *increases* in voiding efficiency.**

Afferent feedback from the EUS is **inhibitory**?

Conclusion

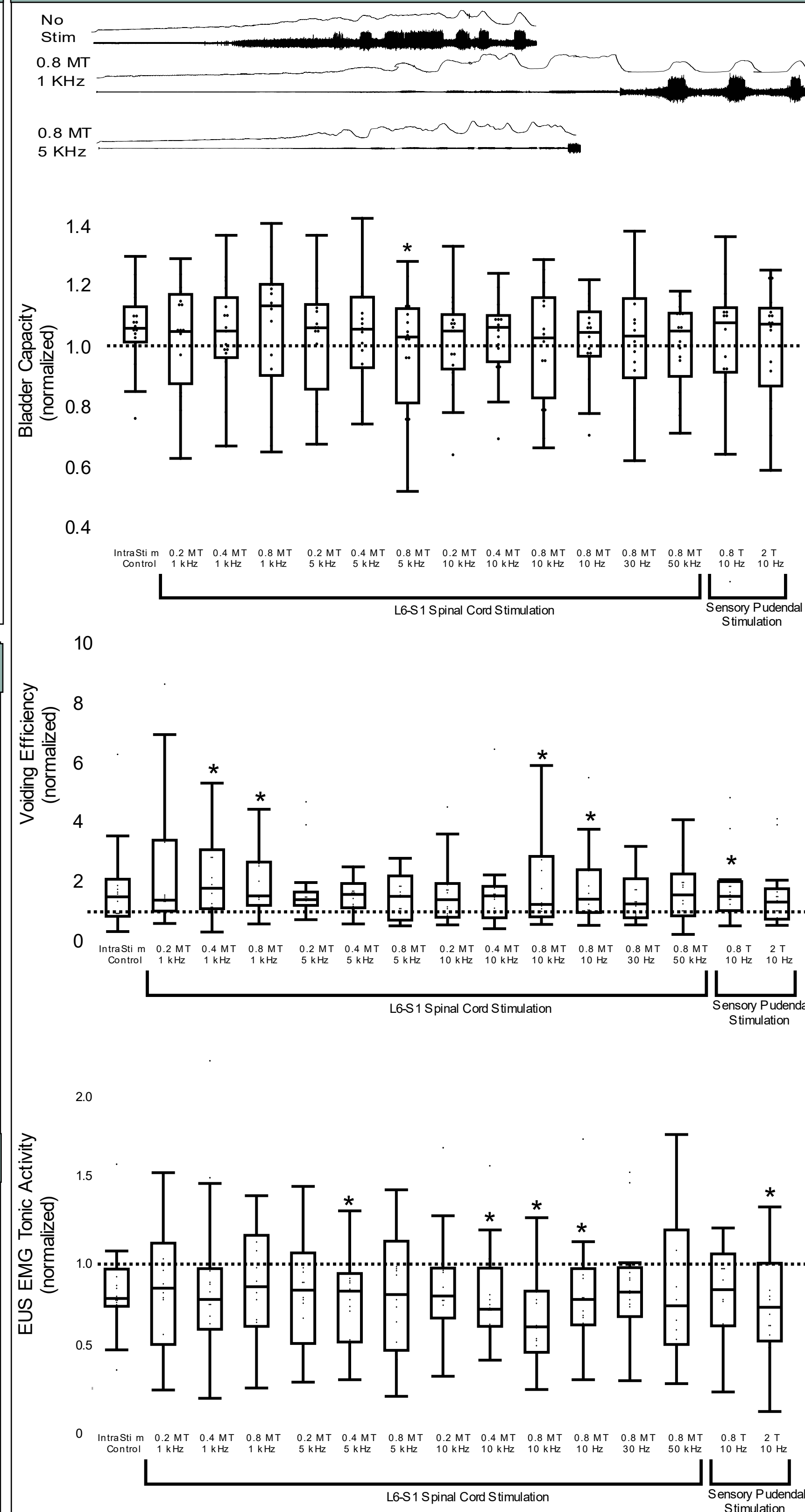
Potential mechanism of action → modulating afferent input from the bladder/EUS

KHF SCS may be a viable approach to restore bladder function after SCI.

References

- Weld KJ, Dmochowski RR (2000) Association of level of injury and bladder behavior in patients with post-traumatic spinal cord injury. Urology 55:490-494.
- Steadman CJ, Langdale CL, and Grill WM (2020) Effect of Epidural Kilohertz Frequency Spinal Cord Stimulation on Lower Urinary Tract Function. In preparation.

SCS Improves Bladder Dysfunction after SCI



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