

# Acquisition and Assessment of Locomotion Performance in Pre-Spinal Cord Lesion *Macaca fascicularis*: Building a Framework for Recovery

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Despite the many recent breakthroughs in neuroscience, one aspect that continues to pose a challenge to researchers is the reversal of paralysis caused by trauma, disease, or degeneration in the spinal cord. Spinal Cord Injury (SCI) occurs relatively frequently and is associated with substantial impairments to the physical, economical, and mental health of affected individuals. Loss of voluntary motor control due to SCI is one of the most detrimental effects, though there currently exist no treatments to fully restore this function. Brain Spine Interfaces (BSI) could be the key. The main study will test the hypothesis that spatiotemporal stimulation-enabled training will facilitate locomotion in non-human primates (NHPs). This project contributes to the advancement of the main study by establishing the platform necessary for quantification and assessment of locomotion proficiency. Using a code adapted for this model, motor function will be assessed over a variety of tasks, including treadmill, corridor, ladder, and hind limb reach and grasp. NHP performance on the treadmill before and after the implantation of a titanium mesh on the skull (used to provide more support for future implants) is evaluated and a variation in gait profile is observed.

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