Abstract

Our work focuses on understanding and enhancing activity-driven plasticity within the lumbar spinal cord that leads to recovery of locomotor function after severe SCI. We demonstrated that using a combination of pharmacological and epidural electrical stimulation of the lumbar spinal cord leads to recovery of stepping ability even after complete transection of the cord. The neural mechanisms underlying such recovery are still not well understood. We have also investigated the effectiveness of combining rehabilitation and neuromodulation strategies with other plasticity enhancing interventions such as anti-Nogo-A antibody, chondroitinase ABC, etc. Our results demonstrate that when plasticity is enhanced following SCI it is necessary to combine activity to drive functional recovery positively. We have reported surprising deficits in function when two individually positive interventions were combined.

